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Color Standardization for Advertisements

Lack of Color Uniformity and Its Effect on Advertising—Adopting Standards Inks—Co-operation of All Interested Factors Enlisted

By WALDON FAWCETT

COLOR translation to the public has not kept pace with color production and the glorification of color in design. That is to say, the representation of colors in industry by means of advertising illustration has failed to do justice to the color gradations and the color combinations that have been evolved in this age of infinite variety. Hence industry will welcome the nation-wide movement, organized under authoritative auspices, to elevate the standards of color reproduction.

That the color-using industries should find anything to quarrel with in the picturization of their products must, at first blush, appear strange, for in every technical aspect the printing industry has made notable progress in recent years. Furthermore, the magazines and popular weeklies of national circulation have bestowed particular attention upon color advertising. The fatal flaw, it is now confessed, has existed in lack of color uniformity.

Color disparities in advertising have communicated to the lay public a sense of color uncertainty. It is not that the best of the color reproductions have not, in tone and brilliance, done full justice to the products that they vivify. Rather is it that representations in different prints of the same colored article have shown disconcerting discrepancies that have left the prospective buyer in uncertainty as to what he would receive in color, and to that extent have sapped the value of advertising. As long as five years ago a movement was launched for color stabilization or standardization in advertising.

Initiative was taken by the American Institute of Graphic Arts, a scientific body working to improve the application and use of the various processes of graphic reproduction. The institute enlisted the co-operation of various national organizations, including the Association of National Advertisers and the American Association of Advertising Agencies. The last-mentioned organization, through its Committee on Mechanical Production, has a contact with the practical phases of color reproduction that has been exceedingly valuable to this enterprise.

The Need Recognized

Not merely because the spirit of standardization is in the air in commercial America was this remedy adopted for the advertising ailment. The prescription required was as obvious as the need. The universal adoption of four standard colors of printing inks would go far to cure the difficulties. Nor, for that matter, was it difficult, in due course, to arrive at the proper colors. This was accomplished in the early stages of the work. What was tedious and what demanded tact was the enlistment of the co-operation of the periodical publishers who present advertisements in full color, and then the extension of the missionary work, step by step, to engravers, printers and paper makers.

The support of the majority of the engravers was won by the preliminary test, which reproduced with the standard colors better results with the same plates than were reproduced with the heterogeneous colors chosen by the various engravers. The sole exception was one subject where the strong purple blue of the original plate could not be easily reproduced by the red and green of the standard colors. The colors used in this test were furnished by seven or eight ink houses. Before the run was completed three different ink makers' inks of one color were mixed together.

Results with mixed inks, which demonstrated that any ink maker may meet the requirements of the standard colors, have tended to align the ink industry sympathetically with the new project. There is, at that, not much doubt that this standardization will exert more or less revolutionary influence upon the

printing ink industry. In the past engravers have been prone to select their inks solely on color appeal and without much regard for permanency. Indeed, in the opinion of Arthur S. Allen, the color specialist who conducted the tests, very few of the inks heretofore used by engravers have been fast to sunlight. The standard inks as now perfected are reasonably permanent.

Superstition or tradition in color advertising was jolted when a committee of the Association of Advertising Agencies made arrangements to send out proofs of the four standard colors to all the large publishers of the country. These proofs were printed on machine-finish, super and coated paper, and the investigators were surprised to find only slight differences between the papers. It was a refutation of the axiom that inks must be specifically suited to the surface of paper on which impression is to be made. The current experiments indicate that it is necessary to carry more color on machine-finished than on coated stock, thereby tending to darken the shade. But color harmonies are not impaired under standardization as when color is changed to fit the paper, thereby throwing out the effects of the other colors.

Colors Not Theoretically Perfect

The allied forces in the color-regulation movement do not assert that the standard colors which have been adopted are the perfect process colors from a theoretical viewpoint. It is acknowledged that sacrifices have been made to practical considerations, and particularly to permanency. Ultimately it is hoped that the standard colors may be brought even closer to theoretical perfection. In the meantime the present color code is accounted a distinct advance over the old status, in which there was no agreement as to what shades of red, blue and yellow should be used.

Under color standardization users of color advertising are promised not only uniformity in color portrayal in the different magazines and other forms of advertising, but an improved quality in the reproduction of the originals. It is realized that the manufacturer of an article ornamented with unusual color is under some temptation to seek a special hue or tint of printing ink that will do justice to his novelty. Nevertheless, he will, it is asserted, do better in the long run to accept a standard color—in whatever gradation of intensity best serves his purpose—and thereby insure dependable reproduction in all quarters, than to insist upon a "special" which is likely to realize his ideal in only a few instances and, for the remainder, leave him worse off than if he accepted a standard color and authorized the engraver to work with that from the outset. Publishers of more than sixty national periodicals have adopted the standard colors and a considerable proportion of advertising agencies are submitting all color plates proved in standard process colors.

The Effects of Aftertreatments on the Degree of Aggregation, Location, Shade and Fastness Properties of Insoluble Azo Colors on the Fibers*

Publications on the Subject—The Author's Investigations—Tests on Various Fibers—Comparative Findings—Changes in Hue and Fastness—The Best Treatment for Azoic Colors on Cotton

By PROF. F. M. ROWE, D.Sc.

DURING the past seven years Rowe has carried out a series of investigations of insoluble azo pigments in substance and upon the fiber. The last of his publications dealt briefly with the "blinding" of the luster of artificial silks dyed with certain of these coloring matters, and showed that this phenomenon is due to the coagulation of the pigment into larger aggregates within the fiber brought about by moist heat. A more comprehensive investigation was begun in 1925 in collaboration with Dr. Percy Bean, of which the present paper is a record, for, although it was known that certain aftertreatments of cotton and artificial silks dyed with Azoic colors influenced the shade and degree of fastness of the dyed material, at that time no complete explanation of this behavior had been advanced.

In the interval, however, papers by Haller and Ruperti, Löchner, Kayser, Schwen, and Scholl have appeared in Germany, each dealing with a limited section of the question, such as the influence of aftertreatments upon the degree of aggregation of pigments in dyed materials, the migration of the aggregates in the fiber, and the relation between the fastness properties, shade, degree of aggregation and location of the coloring matter in the fiber. These publications are reviewed critically in the light of the results of the present author's own independent investigation of thirty combinations of diazotized bases and members of the Naphthol AS series dyed on gray cotton, bleached cotton, mercerized and bleached cot-

*Abstract of a paper read before the Nottingham Section on December 19, 1928.

ton, ordinary viscose silk, and Celta hollow viscose silk.

The dyed materials were submitted to numerous aftertreatments of graded severity in water, soap solution, sodium carbonate solution, caustic soda solution, etc., for varying periods over a range of temperatures and pressures. The effect of these treatments upon the degree of aggregation and location of the pigment in the fiber, its shade, and fastness to light, rubbing and bleeding, was determined comparatively with patterns of each dyeing. Conclusions based on microscopic examination of dyed fibers can only be regarded as representative if not less than 200 fibers are examined from each pattern. Cross-sections obviously would be preferable to longitudinal views for the determination of the location of coloring matter aggregates in the fiber, especially in the case of fibers containing a central canal. Cross-sections, however, can only be used to demonstrate that pigment particles are disseminated throughout a solid fiber and do not represent truly the condition prior to cutting, because with any fiber containing aggregated pigment and especially with hollow fibers, the razor largely drags out these particles, leaving torn and less colored sections.

Hot aftertreatments influence the state of aggregation and location of Azoic colors in the fiber in varying degrees according to the nature of the dyed fiber, the constitution of the azo compound, the depth of shade and the severity of the treatment employed. Moisture is essential, although a trace is sufficient, for the aggregation and migration of the pigment, which proceed in definite stages. With dyeings at appropriate depth the untreated fibers are uniformly colored and virtually free from visible pigment particles. The first effect of treatment is a change to fibers in which the cell walls are evenly colored by minute particles of pigment, visible at moderately high magnification, but substantially without any material alteration in their location. The particles next increase in size, but growth in the swollen cell walls cannot proceed indefinitely without rupturing the fiber. Consequently the particles migrate to a free surface where growth can continue more readily

Severe treatments which promote swelling of the fiber substance facilitate migration, but the direction of migration depends upon the nature of the fiber. In solid fibers, e. g., originally viscose silk, migration is always outwards, so that the center of the fiber becomes colorless. Aggregation then continues at the outer surface, from which the crystals are easily removed, finally leaving the whole fiber colorless. With hollow fibers, e. g., cotton or Celta viscose silk, the particles migrate inwards to the lumen and also outwards to the cuticle, ultimately leaving the cell wall colorless. Growth continues at each surface, but the pigment is so easily detached from the outer surfact that eventually severe and prolonged aftertreatment leaves crystalline coloring matter merely in the lumen.

This appears to have led Kayser to the erroneous conclusion that the migration of the pigment in cotton is wholly inwards, whereas actually rather more migrates outwards into the solution used for treatment than inwards to the lumen. Microscopic comparison must be made only between fibers of similar structure, for a particular treatment gives diverse results with cotton hairs, for example, according to variations in the thickness of the cell walls of the hairs. Hairs of similar structure, however, no matter from what part of the material they are taken, usually contain the coloring matter aggregated and distributed in the same way.

Aggregation and migration occur more readily in viscose silk than in cotton. No two coloring matters are aggregated at the same rate or in exactly the same manner by a given aftertreatment under the same conditions, although similar results may be brought about in each case by varying the severity or duration of the treatment. Aggregation and migration, especially with azo compounds of β-naphthol, proceed slowly even at the normal temperature and humidity of the air, as was proved by the examination of dyeings kept in pattern books for twenty to forty years. Dry heat has very much less effect upon Azoic colors on the fiber than moist heat at the same temperature, but dry heat at a sufficiently high temperature (250° to 300° C.) acts in the reverse direction and disperses any visible pigment particles already present in the fiber.

Aggregation proceeds slowly in water at moderate temperatures, and more rapidly and completely at higher temperatures and increased pressures. Hot soap solution produces a similar effect more rapidly than water alone, and the outer surface of the fibers is usually more free from coloring matter owing to the removal of the aggregates by the solution. The same is true of alkali, or alkali and soap solutions.

Aggregation and migration of Azoic colors in the fiber are accompanied by changes in hue and brightness of the dyed material, and also by changes in the fastness to light, rubbing and bleeding. The change in shade corresponds exactly with that anticipated from the degree of increase in the size of the pigment particles, while variations in the brightness, and fastness to rubbing and bleeding, depend upon the quantity of comparatively large pigment particles which remain collected on or near the surface of the fibers.

In searching for azo combinations to resist kier boiling, the ease of aggregation and migration of the coloring matter in the fiber is a reliable guide, for combinations which aggregate readily must bleed and mark off during kier boiling. The fastness to light increases with increase in the size of the pigment particles remaining in the fiber, irrespective of their location in the fiber. Nothing was observed to support the view that the increased fastness to light might be due to driving the coloring matter into the interior of the fibers. In fact, the fastness to light

increases with increased aggregation to the same extent on ordinary viscose-rayon as on cotton, yet in the former the migration of pigment is solely outwards. The increased fastness to light is due merely to decrease in the surface area of the coloring matter exposed.

In actual practice, treatment with dilute soap solution, with or without sodium carbonate, at or near the boil for a short time appears to be the most suitable general aftertreatment for Azoic colors on cotton. The object should be to remove loose surface pigment and to produce the first stage of aggregation within the cell wall, but to limit subsequent growth of the pigment particles and their migration as far as possible. This results in increased fastness to light, varying in degree with individual coloring matters, but with the minimum decrease in fastness to rubbing. Some change in hue usually indicates that the treatment has been sufficient, and it should then be stopped, as further treatment affects the fastness to rubbing adversely and causes undue loss of coloring matter from the fiber. In fact, any aftertreatment of dyed rayons, except to remove loose, surface pigment, is undesirable, because sufficient aggregation to produce a material increase in fastness to light must result in blinding the luster. Combinations should be selected for dyeing artificial silks, which are not only sufficiently fast to light as they are produced in the fiber at first, but which also do not tend to aggregate appreciably in any hot soaping to which the dyed material may be subjected subsequently.

A point of especial interest is that Azoic colors produced directly upon the fiber are normally regarded as faster to washing than ordinary water-soluble direct cotton dyes, because of the insolubility of the former in hot water, alkalies or soap solution, yet it is possible largely to remove pigments of this type from the fiber, in spite of their insolubility in the agents employed.

Other chemical classes of pigments also undergo aggregation in the fiber in proportion to the ease with which they crystallize. Indigo aggregates and migrates in the fiber more readily than many azo compounds, but anthraquinone vat dyes, sulphur dyes, etc., aggregate with very much greater difficulty.—*Chemistry and Industry.*

SYNTHETIC DYES IN POLAND

While Poland has sufficient production of the raw materials used in the manufacture of organic dyes, such as benzol, phenol, toluol, naphthalene, and pyridine, these are mainly exported and practically all intermediates for the manufacture of dyes are imported from Germany and France. The chemical industry of Poland, with the the support of the Government, is now endeavoring to inaugurate the manufacture of nitrated intermediates with the view to their further manufacture into dyes. Certain nitric acid compounds, the "H" and "Gamma" acids and benzidine are now manufactured in Poland in small qantities, according to a special report from Commercial Attache Clayton Lane.

Annual production of dyes in Poland amounts to approximately 1,500,000 kilos, valued at more than 15,000,000 zlotys. (Average value of the zloty in 1928 was $0.11209 United States currency.) Total consumption is said to average 2,500,000 kilos of dyes of normal concentration.

Of the total quantity of dyes used in Poland about 50 per cent are sulphur, direct and wool blacks, with predominance of direct black. Lake, sulphur, direct and wool dyes other than black constitute 33 per cent of the total demand, while basic and other dyes make up the balance. Basic dyes and other more expensive varieties are not manufactured in Poland.

The German I. G. Farbenindustrie practically controls the market in Poland owing to the proximity of its plant, and, in a large measure, also to the conservative attitude of Polish customers who are accustomed to German dyes, and have their successes adapted to German dye formulas. Furthermore, credit plays an important part in sales of dyestuffs in Poland, and the Germans are offering credit freely.

"GOLDEN FLEECE" PAGEANT A HUGE SUCCESS

Colorful Style-and-Music Show of the Wool Industry Draws Large Crowds

It was estimated that more than fifteen thousand attended the elaborate pageants of the American wool industry staged, under the title of "The Golden Fleece," by the Wool Institute, Inc., during the week of March 18 at the Hotel Roosevelt, New York. At least five hundred were turned from the doors for lack of seats, it is believed, and at every performance the "S. R. O." sign was hung. Two performances were given daily from March 18 to 23, one in the afternoon and one every evening.

The pageant was a clever and unique combination of style display and musical variety show. Its chief function was, of course, as an exhibition of fine woolen apparel. The production was designed and staged by Clark Robinson and directed by Chester Hale. The theatrical costumes used in the pageant were entirely of wool, and the ballroom of the hotel, in which the show was staged, was luxuriously draped in woolen banners and decorations.

The style show was set against a spectacular background of high-class entertainment provided by a ballet of the Chester Hale girls, the comedians Lewis and Dody, a pair of dancers and a soloist, Miss Eva Clark. This entertainment comprised an elaborate prologue and finale, five highly amusing "episodes," and a number of special features scattered throughout the week. Special morning style showings were given for the trade.

The pageant was made possible through co-operation of mills that make up the membership of the Wool Institute.

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

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ORGANIZATION MEETING OF THE MIDWEST SECTION

New Section Makes Enthusiastic Start, with Sixty at First Meeting

ON Saturday evening, March 16, a meeting was held at the Hotel Bismark in Chicago of those members of the Association who were interested in forming a Midwest Section. There were also present a number of guests and prospective members. Among the guests was Dr. E. H. Killheffer, President of the Association, who had been especially invited. Invitations to this meeting had been previously issued by Carl E. Bick, of Real Silk Hosiery Mills, who presided. After the dinner the meeting voted to sign a petition to the Council requesting the formation of a Midwest Section. This petition was immediately signed by the requisite twenty-five Active members in good standing of the Association and was thereupon submitted to President Killheffer who accepted it in the name of the Council and designated in the name of the Council, Carl E. Bick as Temporary Secretary. Mr. Bick then proceeded to the organization meeting of the section, which resulted in the unanimous choice of Mr. Bick as Chairman; A. T. Brainard, of the Ciba Company, as Vice-Chairman; John W. Kopf, of Newport Chemical Works, as Treasurer, and Clarence Wille, of Burson Knitting Company, as Secretary. The section also elected M. A. R. Selisch, of the Thread Mills Company, Marshall Field & Co., as a member of the Nominating Committee.

A paper was presented by M. A. R. Selisch on "The Dyeing of Embroidery Cotton with Vat and Naphthol Colors."

The President of the Association, Dr. Killheffer, made a short address in which he described some of the activities of the Association to date and the tremendous field for activities ahead. He stressed also the importance of having an Association such as this wherein the technical men in the various branches of the industry can get together regularly and discuss their various problems with one another, as well as carry on constructive development work for the future.

Carl E. Bick, unanimous choice for the first Chairman, took the meeting well in hand, and as he enjoys such personal popularity his choice was a very wise one.

This first meeting was attended by about sixty and got off to a very enthusiastic start, which gives great promise for the future. It was regularly voted that we

should call this section the Midwest Section, and the territorial boundaries were set as comprising the States of Wisconsin, Iowa, Illinois, Indiana, Ohio, Michigan, Minnesota, Missouri, Kentucky and Colorado. It was decided to hold the next meeting at the same place on the evening of May 18.

CLARENCE WILLE, *Secretary.*

FEBRUARY MEETING OF PHILADELPHIA SECTION

THE regular February meeting of the Philadelphia Section was held in the Student Club Room of the Philadelphia Textile School on Friday evening, March 1.

At 6.30 p. m. ten members and guests met in the City Club of Philadelphia for the usual informal dinner.

At 8.15 p. m. the Chairman, A. M. Burt, called the meeting to order in the Student Club Room of the Philadelphia Textile School. There were thirty-seven present.

The minutes of the last meeting were read and approved as read.

There being no reports from committees, old or new business, the Chairman introduced Daniel McGowan, of the National Aniline & Chemical Company, of Philadelphia, who read an interesting and instructive paper on the subject, "Remarks on Troubles Experienced in a Hosiery Dyehouse." The reading of the paper was followed by a discussion which appears herewith in full with the paper.

Mr. Burt then introduced Mr. Croft from the Celanese Corporation of America as a visitor, with the request that he give us some comparison of the Continental and English textile plants with the American.

The meeting was adjourned with a rising vote of thanks to the speaker at 9.15 p. m.

PERCIVAL THEEL, *Secretary.*

Remarks on Troubles Encountered in the Hosiery Dyehouse

By DANIEL MCGOWAN
National Aniline & Chemical Company, Philadelphia

IN speaking on the troubles encountered in the dyehouse, we have unquestionably a very wide field but in the remedies for these troubles we are, of necessity, limited as troubles are general, while the remedy is often specific. Undoubtedly most of those present have encountered many varieties of trouble, oftentimes trivial but many times of a serious nature. Troubles due to carelessness, of course, need no discussion. This is the individual dyer's hardship and upon him alone rests the remedy.

It is almost impossible to generalize dyehouse troubles, each branch of the dyeing industry encountering troubles peculiar to that particular type of dyeing.

Hosiery dyeing being probably the most widely distributed branch at the present time is worth first consideration. This branch, too, probably encounters more differentiated troubles than all other dyehouses put together.

At this time, in this particular territory [Philadelphia and vicinity], hosiery composed of cotton and silk is in the majority. Of first importance is the correct matching of the shade desired, first on the silk, then to obtain a solid result by bringing the cotton to proper shade. We assume, of course, that the dyer uses every effort to obtain a correct match, sampling carefully after the goods have been washed and using the necessary finish materials. Having passed the lot as being a match within the limits of reasonable possibilities, he is very much upset to have it returned to him as being off shade and immediately swears vengeance on everyone in the mill in general and the poor press room foreman or examiner in particular; but is surprised, on taking the matter up with them, to find the shade does not match, in fact, in many cases has but little resemblance to the sample submitted. He has matched his shade in his north or east light, whatever the case may be, and after finishing, the goods are examined in an entirely different part of the building or another building in a different locality. This is probably the most common and easily remedied trouble of the hosiery dyer. The dyer has at his command to-day such a wide range of dyestuffs that it is possible for him to produce a color giving any desired change in artificial light. His first move, therefore, in starting to match a new shade should be to study the relative change in natural and artificial light. If he will do this and match his shade accordingly so that it matches the submitted sample in both natural and artificial light, he need have no fear of its being examined under different conditions than those in which he passes it. He has used the two extremes and in-betweens will not effect a sufficient discrepancy of shade to cause it to be condemned.

FRICTION STREAKS AND DEGUMMING

Probably the next most ordinary trouble is friction streaks and fuzzing. Here again an application of good common sense is the real remedy. How many of you stop to think of the terrible licking a silk hose takes in the dyeing process? No other animal fiber can compare with in it its resistance to severe treatment. Nature has given to the silk fiber itself a protective coating; the silk throwster goes further and adds oils to protect and lubricate it in the handling, and in the dyeing and knitting operations, but to bring out the beauty of the fiber

this oil and gum must be removed. After this is done we have a delicate material, composed of very fine filaments and easily scarred and broken. This brings us to the dyeing method itself: First, the method which has achieved considerable importance during the past few years, of degumming and dyeing in the one operation. If I am conceded the fact that the silk is quite durable and not easily scarred so long as some of the gum remains in it, then you might be real charitable and agree with me that it should be the dyer's aim to take the gum from the hose as slowly as possible, commensurate of course with the length of time it is taking to produce his shades. A certain length of time must be given to allow the colors used to penetrate the seams and level up on the cotton portions of the hose. If you know your lot must be boiled from forty minutes to an hour, is it not rather foolish to put in sufficient degumming material to remove the gum entirely from the silk in fifteen or twenty minutes? To do so merely exposes the silk, minus its protective coating, to the harsh action of the boiling bath containing an alkaline substance. It is easy to regulate this either through experiments in the laboratory or by carefully watching the dyeing operation.

When the goods are first degummed, then dyed, it is not so easy to regulate, and here the dyer is forced to depend on his ability to obtain satisfactory matches as quickly as possible. Prepare your formulae carefully, either by comparison with previously dyed shades of similar character or, if none of these be available, by preliminary laboratory work, and many headaches due to seeing your samples come in more fuzzed with each addition will be saved. No dyehouse is so small that it cannot afford a laboratory of some sort, and to my mind it is just as essential to have one as to have scales.

Of another hosiery dyehouse trouble, spots, volumes could be written and it would still not be thoroughly covered. Streaks, dye spots, oil spots and mildew or mold all have their own little niche in the dyer's trouble box. They are the specific troubles which it would be foolhardy to try and treat generally. Each kind of spot must be carefully analyzed and an attempt made to trace it to its source. This is not always easy, but can invariably be done if conscientiously gone after.

One other slight trouble encountered in the silk hosiery dyehouse is that caused by tinted silks boiling out into other fibers, but I think I can tell you, without any breach of confidence, that the silk throwsters of the country are expending considerable money and effort in an attempt to standardize these methods and guarantee to the hosiery manufacturer and dyer that the tinted silks will boil out clear and leave unstained any other fiber contained in the material.

Temperature Control vs. Finger Dipping

Of the other classes of hosiery dyeing, mixed fibers probably rank highest at the present time. It would be very hard to generalize on this subject, owing to the extremely varied combinations used, but one particular point cannot be too strongly emphasized, that of temperature control. When a formula is prepared in a laboratory and reads "dye at 180°," it means just that, not *about* 180° but as near 180 as it is practically possible to dye it. No man can tell when the bath is 180° by dipping his finger in it. He gets burned twice: his finger and his results. Temperature plays an important part in the development of the color on the fiber, some colors will give at least twice the depth at 180° that they will at 160°. It is so easy to be positive regarding the temperature. "Old Man Fahrenheit" will take care of the job very nicely for us and much more accurately and comfortably than our finger. When the laboratory, either your own or an outside one, turns out something good for you, give them a break and follow the dyeing instructions as clearly as possible.

We might cite in this instance hosiery composed of cotton, viscose rayon and acetate rayon. We have here three entirely different fibers; true, the cotton and viscose are dyed by the same type of colors, but to a greatly differing degree as to depth of shade. The acetate rayon, of course, requires an entirely separate and different type of dyestuff. The formulae from the laboratory will specify a definite temperature at which the dyeing operation should be carried out. That temperature is necessary to develop the color, both on the acetate rayon and the rayon and cotton. A lower temperature will produce a lighter and possibly quite different character of shade; a higher temperature is very harmful to the acetate rayon. This is true also where only cotton and viscose are used. At some definite temperature a certain combination of colors will produce the most solid results on the two fibers, and when the laboratory works this out the dyer should follow it and he will save himself a great deal of trouble.

Shrinking in Wool Hose

In wool hosiery dyeing probably the most common trouble is shrinking of the goods. This can be largely overcome by making sure, after the scour bath, that the material is washed absolutely clean of all soap or alkali before going into the dye bath to be boiled, as the smallest amount of soap or soda in this hot dye bath will cause the hose to shrink considerably, so we cannot really class that as a dyeing trouble but one of scouring.

Wool hose containing silk or rayon effects are at times a source of considerable trouble, especially when they are dyed with chrome colors, as in blacks and blues,

in so far as keeping the silk clear is concerned. This is, in most cases, due to the varying relation of volume of water in the dye bath to the amount of material being dyed. It is almost essential to keep a normal relation in the bath, as when the bath is very long in proportion it is almost impossible to get the silk effects to clear up. Adding extra chrome and acid to compensate for the long liquor does very little good and usually results in bringing the shade out thin and grayish, particularly in blacks.

(Applause.)

Discussion of Hosiery Dyeing Troubles

Chairman Burt—Now, gentlemen, it is very important that we should have discussion on the paper that has just been read, and I am going to ask Prof. Bertolet if he won't lead the discussion, encourage it as much as possible.

Mr. Bertolet—I think, Mr. McGowan, it would be a good idea if you could give us your experience in the dyeing of three-fiber work.

Mr. McGowan—By three-fiber do you mean the silk, rayon and cotton?

Mr. Bertolet—Yes, mercerized cotton.

Mr. McGowan—I think it is much easier to answer questions. Do you just mean the general theory of it? It's rather broad, Mr. Bertolet, and it's pretty hard to generalize on it.

Mr. Bertolet—Well, I appreciate that. Perhaps in every case you have as the most important thing the choice of a dyestuff, and second, the effect of temperature, concentration and time, etc.

Mr. McGowan—The method of procedure and the dyeing of it and the relation of the water in the bath to the amount of goods being dyed. That is very essential, because rayon and cotton are very much affected by different ratios of dye liquor to the material being dyed.

Mr. Bertolet—Yes, that is true, and then the thing I was going to say, the use of Glauber salt or common salt—

Mr. McGowan—Well, where rayon is being used it is much better to use Glauber salt. That is conceded. The salt has a rather bad effect on rayon.

Mr. Bertolet—Just why is this claimed to be so?

Mr. McGowan—Well, it stiffens the rayon to a certain extent; causes the direct colors to go on to the rayon, particularly in heavy shades and even on mercerized cotton.

Mr. Bertolet—Is that due to the fact that Glauber salt contains water crystallization?

Mr. McGowan—No, to the fact that the dyestuffs are precipitated much more readily by Glauber salt than by common salt.

Mr. Bertolet—You see what I mean? You take common salt; there is no moisture in it, but in the Glauber salt there is quite a percentage of water of crystallization.

Mr. McGowan—Yes, but the difference in the moisture is overcome by using a higher percentage.

Mr. Bertolet—Were you figuring on using 20% of either one in a bath, equal percentages as the case might be?

Mr. McGowan—Well, then you would have a much weaker salt bath with Glauber salt than if you use common salt.

Mr. Bertolet—Have you ever found in three-fiber work a relationship between the ease with which a substantative dye dyes wool and its even dyeing qualities on rayon and cotton? For example, if a color boils on the wool easily, do you find that is better for three-fiber work in giving solid or even shades?

Mr. McGowan—No, not nearly. Some of the colors which dye wool quite readily have not as much affinity for rayon as some others that are hard to get on the wool; for example, Direct Sky Blue FF, which dyes silk very readily but has very little affinity for wool.

Mr. Bertolet—Take a dye like Erie Yellow WB.

Mr. McGowan—Well, that is just generally a good union color; has almost equal affinity for all fibers.

Mr. Bertolet—How about the Direct Greens?

Mr. McGowan—Those on an average have much greater affinity for rayon than for cotton, even in light shades.

Mr. Bertolet—What I was trying to point out was whether you have found a relationship between the facility with which wool is dyed with substantive dyes and the affinity this same dye would show between viscose rayon and mercerized cotton in the three-fiber dyeing. In other words, can we lay down a generality in this connection?

Mr. McGowan—I have never found that relation at all.

Mr. Bertolet—In the three-fiber work, what has been your experience in the use of the salt in the bath, in the light shades and in the dark shades?

Mr. McGowan—Salt has the property of dyeing the color on the rayon, even after the bath is exhausted; rayon is peculiar in that light shades are very hard to color and dark shades very easy to color—too easy, in fact.

Mr. Bertolet—You suggest then that the salt be used in the light shades and not in the dark?

Mr. McGowan—Not if you can possibly keep away from it. It is much better to select your colors which have a fair affinity for the rayon; in fact, quite a few are getting away from the use of salt entirely, owing to the need for additions to the bath to bring the shades up, particularly in the light, as they run to-day.

Mr. Bertolet—Can I suggest in my classes in a combination of that kind that no salt be used in dark shades and salt be used in light shades?

Mr. McGowan—Yes. That is true so far as getting a level result is concerned; that is, in dyeing rayon and cotton, but if you use salt in your dye bath and a light shade, I guess probably in ninety-nine cases out of a hundred you have to do shading and if you get that salt into the bath and then have to shade your color, it is very hard to get colors in evenly—if you have common salt in the bath.

Mr. Bertolet—Of course, you wouldn't use 20%; maybe 2% or 5%.

Mr. McGowan—Even with 2%, if you are using a light percentage the Glauber salt is just as effective, without precipitating adjoining colors readily and causing unevenness.

Mr. Bertolet—Could you name the colors of your company that you find are giving the best results for three-fiber work?

Mr. McGowan—Erie Pink 2B; for a yellow, Erie Fast Yellow WB, which is rather a hard color to shade on, usually the Erie Yellow Y is used. That is very good, except it has rather a disagreeable tendency to shade off if it lays around long. Erie Yellow Y (Chrysophenine), is very soluble, even when salt is used in the bath and if you don't use much salt, you have a certain capillary attraction which draws the moisture over and brings the color with it, causing dye streaks. That is particularly true in heavy shades.

Mr. Bertolet—What is the effect of the soluble oil in the three-fiber dye bath?

Mr. McGowan—Persistent penetration; also assists in leveling up the rayon and cotton, especially in heavy shades.

Mr. Bertolet—And you recommend a high percentage rate up to ten?

Mr. McGowan—Yes, in heavy shades, without the use of salt. Soluble oil, quite contrary to many people's ideas, increases the affinity of the material for direct dyes. You get a heavier dyeing in a vat without salt if you use soluble oil than if you didn't. It is usually termed a leveler of colors, but I think that idea comes from the fact that it helps to get the goods out more, opens up the fiber.

Mr. Bertolet—There is a certain salt content, too; maybe a certain proportion is salt.

Mr. McGowan—There is a slight acidity there that causes that.

Mr. Bertolet—Do you find the one-bath method of dyeing in three-fiber work is being done to a great extent or is it usually boiled off first?

Mr. McGowan—In hard water it is being done considerably. In soft water it is rather unsatisfactory.

Mr. Bertolet—Usually with three-fiber work dyers object to attempting the one-bath method because of the amount of oil and impurities in the rayon.

Mr. McGowan—That is perfectly true and if water has any hardness at all it has a tendency to separate that oil out and cause oil spots on the finished goods, especially in metal machines.

Chairman Burt—I would like to ask your opinion about the great differences in methods of degumming silk; some of the dyes are degumming in an hour's time and others are degumming overnight. Do you think there is a decided preference between those two methods?

Mr. McGowan—I think the men who are degumming overnight are those who soak—they soak overnight. That is not actually degumming. It is more or less like that you get in wool, crabbing of wool or cotton to set the fiber straight; in the knitting, especially of this chiffon hosiery, oftentimes the tension will loosen up a bit and the threads will get out of place. If the goods are soaked first, that softens the gum without actually taking it out and gives the threads out of place a chance to slide back in place, and when the temperature is raised it doesn't set them in that kink—it is really a kink that they get through being loosened up more than the rest of the stocking. If it is put right into the boiling vat, the minute they hit that, before the gum has a chance to soften, the heat reaches the yarn and sets that slight kink in there, which couldn't be pulled out again, so that is really one of the reasons for putting the hosiery in the soaking liquor.

Chairman Burt—Are there any hosiery dyers here tonight? This is a good opportunity to ask questions on a very interesting subject. Are there no other questions that you have in mind?

Mr. Stiegler—I would like to know the effect of Epsom salt after the fiber is dyed in the bath before the acetic acid bath.

Mr. McGowan—Do you mean in wool dyeing?

Mr. Stiegler—No, in silk and cotton hosiery.

Mr. McGowan—You mean they add a finish material, oil or gum, and then make an addition of Epsom salt?

Mr. Stiegler—With the oil.

Mr. McGowan—After the oil is in and the Epsom salt, then the acid?

Mr. Stiegler—Yes.

Mr. McGowan—That is used to precipitate the oil from the bath to get the full value of the oil or whatever finishing product they may have. Epsom salt precipitates oil very quickly. It is not entirely good practice to put it in because you may throw your oil out of solution faster than the goods will take it up and then you will have spots on the goods, particularly if the water is soft water.

Chairman Burt—Mr. McGowan, is it generally supposed that the use of Epsom salt in the finishing of a Sulphur Black dyeing tends to brighten the shade?

Mr. McGowan—Only through the precipitation of the oil. You can't put enough sulphonated oil on the hose; regardless of how much you load in there, you couldn't get the material to take up enough to get that finish which you get by precipitating the oil with Epsom salts.

Mr. Sobocinski—Do you know of any black direct color that will go on the cotton and not on the silk?

Mr. McGowan—Leave the silk absolutely clear?

Mr. Sobocinski—Not absolutely, just a slight amount; say a ratio of about ten to two, on continued boiling?

Mr. McGowan—No, the best one for that is the Black BH, and then you have to make a combination. I don't know of any actual Direct Black which really dyes it black as a straight color.

Mr. Jacobs—In dyeing the acetate rayons in hosiery of that sort, if it happens to be a mixture, do they make a separate dyeing for each type of fiber?

Mr. McGowan—No, they use a separate class of color, dyed in the one bath. The colors are added at different times. There is a special line of colors for the dyeing of the acetate rayon and that is dyed and then the cotton colors are selected which do not stain the acetate rayons at all. They can be used in the bath together at the same time, but you might get a precipitation of one or the other; sometimes you get a precipitation of your direct color, more often when the color is used for the acetate rayon, causing spots and sometimes streaks on the acetate.

Mr. Kruge—I would like to carry one of Mr. Bertolet's questions a little further. Which method do you find most prevalent in hosiery dyeing, one or two bath?

Mr. McGowan—I think that two-bath in Philadelphia, in this territory, is the more prevalent. Soft water is a great drawback in dyeing and boiling off, owing to the fact that you must use so much neutral water that you don't get it fully washed from the goods and when they lay, the color, which is just mechanically attached to the cotton, will run and cause streaks, sometimes on silk but more often on cotton, while on fresh bath you can cut down the amount of neutral colors at least 75%.

Chairman Burt—Is there any other discussion on this subject? . . . Mr. McGowan, we are very much obliged to you.

Now, gentlemen, we have one visitor who does not have the opportunity of coming very often, and I would like to introduce him to you and ask him to talk about something, but I don't know just what to ask him to talk about. Mr. Croft, from Cumberland, Md. Mr. Croft, I know it is taking you at a disadvantage, but can't you tell us something of interest? You might criticize some of the textile plants you have seen or give us a comparison of the plants in this country with the plants in Europe.

Mr. Croft—This puts me to a disadvantage as I wasn't prepared, but if anybody would like to ask any questions on the dyeing of Celanese, I shall be glad to answer them. No doubt a number of you have come in contact with Celanese in your dyeing careers and probably you have had troubles and I shall be glad to make the utmost use of my visit. I am quite sure that some of you must have had experience with the dyeing of Celanese so that if you could state any difficulties that you have come across, I would be very glad to set your minds at rest in regard to the dyeing of that fabric.

Mr. Bertolet—Why couldn't you tell us, Mr. Croft, of some of those plants—as Mr. Burt has suggested—in Switzerland, or perhaps the English plants, as compared with the work that we are doing in this country. How far have we advanced in comparison to their work; in what way are they superior; what are they doing that we are not doing? Could you give us a criticism or comparison like that?

Mr. Croft—From my experience in Continental plants and English plants and American plants I find the American plants are more up to date with new machinery; they are scrapping and buying new equipment, whereas the European plants generally prefer to run their machinery as long as they can, often under unfavorable circumstances. American people always use a yarn dyeing machine, whereas in Europe, as labor conditions are cheaper than here, they generally dye the yarn by hand. That often causes losses due to back-binding, whereas, by using skein dyeing machines, you always get better results from a back-binding point of view. There's one point that I should like to bring out with regard to dyehouses and that is the liquor standardization of water and machines. In some they use the metric system, whereas others use gallons, pounds and ounces, and again you will find some that have a peculiar combination of the metric system and the British system, whereby they use pounds and decimals of pounds. Now, all textile graduates and dyers and colorists, when they leave the colleges, where they have been using the metric system, and enter the plants, they go back to the old system of gallons and pounds. I believe the gallons and pounds ought to get together and bring in the metric system. It is up to the textile graduates and chemists to bring those systems into force and yet they don't do that when they get out into their work. By using the metric system, they will save a considerable amount of color and they would cut down the length of time in dyeing and improve the dyeing formulas and yet they don't do that.

I should be glad to know if anybody here has had any experience with automatic temperature control. Mr. McGowan raised the question of maintaining a dyeing or scouring bath at an even temperature and he mentioned 180° F., but in the dyeing of Celanese, for instance, it is important not to go above a temperature of 176° F. if

you wish to retain the luster on the Celanese, and I wondered if any of you had had experience with automatic temperature control. Are they accurate, or do you get a gradually ascending increase in temperature? Assuming that you set your instrument to record 176°, do you get your variation gradually increasing, going up to 180 or 181°? If any of you have had experience in regard to that I should be glad to hear about it.

Temperature Control

Mr. Endriss—We have had our dyehouse equipment under temperature control for about two and a half years now. We use the air operated valve and I think that you can count on control within about four to six degrees. There isn't any temperature control that I know of right now that will control within two or three degrees, that is, accurately. They may do it for a short time, right after you set them, but you will find the variation will amount to four to six degrees anyhow, shortly after the instrument has been adjusted.

Mr. Croft—That has been my own experience. You can adjust it at 176 and then in half to three-quarters of an hour, that temperature gradually rises and, generally, errs on the wrong side, increases, rather than decreases.

Mr. Endriss—Well, you generally find the temperature will oscillate between two temperatures; it will go down and then rise. Your instrument acts on that principle.

Mr. Croft—Yes, that's the principle on which it operates.

Mr. Endriss—In woolen dyeing we have had a very satisfactory application in our own dyehouse, but the average dyer wants to control a little bit closer than from four to six degrees. Of course, in woolen dyeing we want to keep it as near to boiling without the kettle boiling over and we find we get perfectly satisfactory results if our temperature doesn't go below 203, and our kettle is operated from 203 to 208 or 209 degrees at present.

Mr. Croft—And how often do your automatic recorders require attention, mechanical adjustment?

Mr. Endriss—Not so very often. Generally, we don't have any systematic method in our own dyehouse for checking them. We check them only when we think they are off. They don't require so much attention on that phase. We had a dial thermometer they use for that purpose and I know I have had that thermometer out of the dyehouse for three weeks and there wasn't any call for it.

Mr. Croft—I was talking to a temperature control salesman and he told me that the expenditure on maintenance was about 40% of the initial cost of the instrument.

Mr. Endriss—Well, we haven't had much cost for maintenance with the exception of bulbs. There seems to be a certain amount of depreciation in the bulbs, and very recently we have had to replace quite a few of them. The action, we believe, is more or less electrolytic. It is more or less expensive. I think the average bulb costs $120 or $130.

Chairman Burt—Mr. Croft, I think those remarks were of interest. We may get you up here some time to make a real talk.

Mr. Croft—If someone could ask any questions on the dyeing of Celanese I should be very glad to answer them.

Mr. Stiegler—Is Celanese finding wide use in hosiery three-fiber work?

Mr. Croft—Yes, quite a large use in combination with rayon and real silk and cotton. It has the added advantage that it can be done in the one-bath method whereby you can dye cotton and silk with one color and Celanese with the Celanese color in the same bath.

Mr. Stiegler—Do they get the same shade on the three fibers?

Mr. Croft—Oh, yes, you can dye that any union.

Mr. Stiegler—Is the temperature of that bath not allowed to go over 180°?

Mr. Croft—No, if you go above 180 you will mar the luster on the Celanese, and of course it is always essential and desirable to retain that luster.

Mr. Stiegler—Doesn't it take longer to match a shade at the lower temperature?

Mr. Croft—Oh, no.

Mr. Jacobs—In dyeing, have you ever noticed this trouble: we have some men that were working exclusively on the Celanese with the SRA colors and quite a few of them seemed to have developed some sort of skin eruption and they didn't know quite what to lay it to, except that there might be something in the SRA colors.

Mr. Croft—No, there is nothing in the SRA dyes that will cause any skin eruption. At one time I was making the colors in the color plant, and I never had any trouble with any skin eruption or skin disease or never noticed it on any of the workmen.

. . . A motion made by Mr. Bertolet that Mr. McGowan be given a rising vote of thanks for his paper of the evening was seconded and carried. . . . The meeting then adjourned.

FEBRUARY MEETING OF THE NEW YORK SECTION

THE February meeting of the New York Section was held at the Alexander Hamilton Hotel, Paterson, N. J., on March 1.

There was an excellent attendance for the dinner, more than 100 members and guests being present, while a

goodly number came in for the meeting proper afterwards. The minutes of the January meeting were read and approved, the Treasurer's report received and referred to the Executive Committee for action. Chairman Daniel P. Knowland announced plans for the March meeting and the Secretary told the plans for the April meeting. It was the consensus of opinion of the meeting that the April meeting should be held in Paterson, if possible, and the Secretary was asked to make these arrangements. Mr. Knowland introduced the speakers of the evening:

David Wallace—"Logwood and Its Uses on Silk."

C. F. Hoppe—"Preparation and Printing of Silk Warps."

E. Freedman—"Proposed Method for Describing Washable Materials in Garments."

The usual discussion followed each paper, and after a rising vote of thanks the meeting adjourned about 10.15 p. m.

The introduction of the speakers, their papers and a full report of the discussions are published herewith.

Chairman Knowland—I presume almost every chemist or every mill man, dyer, printer or what-not gets into trouble, particularly when he thinks he knows all about it. I know one time I did. I thought I was pretty nearly right. To make matters straight the argument was settled by sending in the opposing chemist. You know, it's a great relief sometimes to have a man come in who knows a whole lot more than you do and have him show you. I spent a couple of days with our next speaker and I learned so much and his personality impressed me so much that we became great friends. This was about eighteen months ago, but the memory of that pleasant contact has lingered with me ever since. I greatly admired a man who could explain so well all the details connected with logwood, so we arranged with Mr. Kenny to have our next speaker here to-night, and it gives me great pleasure to introduce to you Mr. David Wallace, of the American Dyewood Company. Mr. Wallace!

David Wallace—Mr. Chairman and Members of this Association: It is indeed a pleasure to me to come here, but I think personally my greatest pleasure is in seeing your good Chairman, Mr. Knowland, once again. Mr. Knowland, I think, just about read my mind in what he said. I was going to say that I had the happiest recollection of that meeting I had with Mr. Knowland. It was the first occasion I had had of meeting him, and I wish to congratulate this section on having a man of his ability at the helm. (Applause.)

Before going on to the subject, perhaps a little story might not be out of the way. In my native country we have an officer in our churches known as the beadle. The beadle's duties are many, and they are usually men of queer characters. On this particular occasion there was a strange minister visiting the church and the beadle thought he would have a few words to say to the minister before he went into the pulpit, so he approached the minister and said, "Doctor, do you work from a paper or do you speak extempore?"

He said, "Well, usually I speak extempore, but on this occasion I am forced to read a paper."

"Oh," he said, "that's fine."

So the doctor became interested in the beadle's curiosity and he said to the beadle, "Why did you ask that question?"

"Well," he said, "I asked that question for this reason: those that read from a paper stop when they come to a period, but those that speak extempore, God Almighty doesn't even know when they come to a period." (Laughter.)

So I just wish to say that there is a period to this paper.

The Application of Logwood to Silk

By David Wallace
American Dyewood Company

SOME years ago a writer, discussing the merits of logwood as a dyestuff, truly said that it was the historic and standard black, and to-day the same statement holds good—especially in the *silk* industry. Despite the fact that a tremendous amount of effort and money have been expended in attempts to produce an artificial product to replace logwood, logwood is still recognized as the *standard* of comparison and at the present time there is no artificial color produced which has the virtues of logwood when used for the dyeing of silk.

Wherein lies this superiority? One reason is that logwood produces a true black, the purity of shade is the same, regardless of light conditions (artificial or daylight). Another reason is that it has a most extraordinarily beneficial effect on the silk fiber, particularly on its weight, thickness and feel, a characteristic that is found wanting in the artificial blacks when applied to silk.

It is no wonder then that those silk dyers using logwood for their blacks are proud of their results. The speaker, in demonstrations made in various mills, has had some very pleasant experiences dyeing silk a black with logwood. In no instance was there any criticism given, but always great praise and admiration expressed. In one particular case, he recalls, when the goods were finished, the manager brought in his clerical staff to admire, as he said, a real black. No matter what fashion dictates, the aristocratic color on silk is the logwood black.

Proceedings of the American Association of Textile Chemists and Colorists

What Is Logwood?

Since the discovery of artificial colors a great number of the natural dyes have been replaced. Many of them are now looked upon as curiosities of nature. Logwood is the outstanding natural dyestuff that has survived competition of artificial colors and is recognized as one of the most valuable dyestuffs we have to-day. It is interesting to note that the consumption of logwood in the silk-dyeing industry has increased, particularly since the discovery of its valuable weighting properties, and we who are interested in logwood are indebted to the research work done by P. Heerman, J. Weidmann and others in the development of logwood as a silk weighting agent.

It might be of interest to give a brief description of the history, etc., of logwood. It is botanically called *"Haematoxylon Campechianum"* and to-day is found in Mexico, Honduras, Jamaica and Haiti.

Logwood was introduced into Europe by the Spaniards shortly after the discovery of America, and in all probability was Mexican logwood. The logwood tree grows to a height of from 10 to 12 feet, a height which is attained in from seven to twelve years, depending on the soil and climatic conditions. When ready for cutting, the tree is felled, trimmed of bark and small branches, and in this condition is shipped to the United States and Europe. When freshly cut the wood is of a light brown color, but is dark brown when received here, due to surface oxidation. The matter of selection of logwood for the manufacture of its products for the silk-dyeing trade is a very important one. Years of research on the various types of logwood found in commerce to-day has taught us what particular type is best suited for the silk-dyeing industry. Our work has also led us to a still further classification to meet the demands of the silk dyer, namely, what type of logwood is best adapted for dyeing, and what type for silk weighting. That is to say, certain types are suitable for dyeing and not for weighting, and vice versa. It is to this classification that the successful logwood extract manufacturer must adhere in order to produce uniform products at all times.

The Chemistry of Logwood

Before going any further it might be in order to touch upon the chemistry of logwood. The extractive matter contained in this tree consists of haematoxylin, Hematine, tannins, glucosides, sugars, resins and salts, all of which have some effect when used in the dyeing or weighting of silk. Those of us who are connected with the logwood industry owe much to the work done by Chevreul, Erdmann, and Perkin on the pure chemistry which they have carried out on the constitution of the active principle of logwood, namely, haematoxylin. Although these men do not agree on some aspects of this work, they nevertheless laid the foundations for further work. In our investigations we have found that pure haematoxylin, the coloring principle, has only 60% of the silk weighting value of a dried logwood extract. We are therefore inclined to believe that haematoxylin occurs in the tree in some other form, either as a glucoside, or as a component part of some other compound not in the pure condition. Along the same line it was thought for a number of years that the coloring matter of logwood and brazilwood were the same, until it was established that the chemical formula for haematoxylin was $C_{16}H_{14}O_6$, whereas that of brazilin was $C_{16}H_{14}O_5$, yet brazilwood extract has no weighting property when used on tin-weighted silk; in fact, it has a marked stripping action. When faced with these facts, is there any wonder that complex problems arise when dealing with the manufacture and standardization of logwood products? When the coloring principle of logwood (haematoxylin) is oxidized, it is converted into Hematine. It is in this oxidized condition that logwood is principally used in silk dyeing.

Up to a comparatively few years ago logwood was sold to the dyeing industry principally in the form of chips, and it was left to the dyer to extract the coloring matter. This was carried out by suspending the bags containing the chips in the boiling dye bath. At the best this was a crude process, not only uneconomical, but occasionally very troublesome, as the chips would sometimes get into the dye bath and become entangled in the goods. The chips were sold in two grades—fresh chip wood (unoxidized), and so-called aged, or cured, chip wood (oxidized). This last form was manufactured by exposing fresh cut moistened chips to the air. In this process the unoxidized coloring principles were oxidized, and, as can be imagined, it was a difficult matter to produce a uniform product, as the exact control of oxidation was impossible; also the color value was naturally very irregular. The result was that the use of chipped wood in the dyehouse often led to indifferent results.

To-day the industry has been placed on a scientific basis and everything is under complete scientific control right from the raw material to the finished product. The development of this industry in the past few years has been tremendous, both chemically and mechanically. The present method of manufacturing logwood products consists roughly of chipping the wood and by a diffusion process the coloring matter is extracted with hot water. This liquor is evaporated and chemically treated, according to the final product desired, whether for silk dyeing, or for silk weighting. We therefore find in the market to-day logwood products in the following forms:

Unoxidized Logwood Extract (for silk weighting).

Oxidized Logwood Extract (Hematine paste—for silk dyeing).

And to meet certain demands both of these extracts are also found in the market in the dried form, as logwood, or Hematine Crystals. These crystals are obtained by drying the respective extracts by special methods, so that the color, shade and solubility of the extracts are maintained. This latter process requires careful control, particularly to meet the demands of the silk industry.

Pure Dye Blacks

The application of logwood in the silk dyeing industry is divided into two classes:

1. That used for the production of pure dye blacks.
2. That used for both weighting and dyeing of silk.

In the dyeing processes which we are about to give we will consider only pure black dyeing on boiled-off silk. That is, raw silk which has been stripped of its gum by boiling in a bath of olive oil soap. Without going into details the process is, roughly, boiling the silk out in a bath containing about 30% olive oil soap from a period of from one to three hours, depending on the class of goods. After this boiling off or degumming is finished the silk is washed with hot water. It is imperative that this washing be done thoroughly, as any soap left on the goods after the dyeing process will cause so-called grease spots on the finished goods. The well-washed degummed silk is then ready for the dyeing, which consists of two operations, namely, mordanting and dyeing proper.

Mordanting

Although pure boiled-off silk has an affinity for logwood extracts, oxidized and unoxidized, the shade produced on such is by no means a black, in fact it is a light tan shade. Nevertheless logwood is considered an adjective dyestuff, that is, a dye which requires a mordant to fix it on the fiber. In pure black silk dyeing, the principal mordanting agent used is iron, either in the form of the ferric, or in the ferrous state. In the ferric state, so-called nitrate of iron is used, whereas in the ferrous state, copperas and pyrolignite of iron are used. In conjunction with the iron, fustic or tannin extracts are used. In one case the silk is first treated in a solution of iron, after washing passed through a fustic or tannin bath, with the formation of an iron-fustic, or tannin, lake on the fiber. In the other case this process is carried out in one bath, that is, the fustic or tannin extract is dissolved in water and a solution of iron added, whereupon an iron Fustic Lake is formed, more or less held in solution, which is absorbed by the silk. In the first case, the iron used is in the ferric condition, and in the second case in the ferrous state.

After this mordanting process the silk is ready for the dyeing process.

In pure black dyeing, logwood is used in the form of its oxidized products, namely, Hematine Paste, or Hematine Crystals. In the manufacture of these products for this class of work, standardization has to be carefully carried out, particularly as regards oxidation, for if a product is used which is too highly oxidized, the alkalinity of the soap used in the dye bath acts as oxygen carrier and further oxidation takes place with the formation of insoluble bodies, which cause crocking on the finished goods. On the other hand, if the oxidation of the Hematine Paste is not high enough, full economic value of the dyestuff is not obtained, as the bath is not sufficiently exhausted.

In the dyeing operation the iron mordanted silk is entered into a more or less concentrated bath containing Hematine together with soap, and dyed at a temperature varying from 150° to 180° F. The temperature of dyeing has a marked effect on the shade of the finished goods, and is an important element in the dyeing operation, inasmuch as the shade produced may vary from a bluish black to a jet black depending on the temperature maintained.

Formulae for Pure Black

The following practical formulae cover more or less the various methods of producing a pure black.

Formula A

Treat the boil-off silk in nitrate of iron bath 20° Tw. cold for one hour, then wash thoroughly. Enter the silk into a bath made up of 25 to 30% Fustic Extract at a temperature of 150° F. and then bring slowly to the boil and boil one hour. Wash cold, then enter into a dye bath containing 25 to 30% Hematine Paste, 25 to 30% olive oil soap and run at 120° for a few minutes, then raise slowly to the boil and dye until the bath is exhausted. Wash thoroughly in two lukewarm waters. The silk is then finished by treating same in a bath containing 3% acetic acid, or formic acid, and about 1% olive oil previously saponified with soda.

Formula B

The boil-off silk is treated as in Formula A in a nitrate of iron bath, then washed, and then dyed in a combination bath containing fustic, Hematine, and soap, in approximately the following proportions:

30% Fustic Extract
70% Hematine Paste
50% Soap

Dyed and finished as in the previous formula.

Formula C.—So-called French Black

Prepare dye bath with

30% Fustic Extract
40% Hematine Paste

Heat up to 160° F., enter the silk and give ten turns. Lay up silk and add

4% Copperas
1% Bluestone

previously dissolved. Turn on steam and work the silk up to a boil. A scum will form which should be taken off with the bowl. Give ten turns at the boiling point, then wash well in warm water. Brighten with 20% olive oil soap at 150° F. ten turns. Wash in warm water, two changes, and finish with 2% acetic acid and small amount of olive oil emulsion.

Formula D—English Black

Mordant one hour at 165° F. with

8% Fustic Extract
8% Copperas
4% Bluestone

Rinse and dye with

30% Hematine Paste
30% Soap

This last formula with modification in the ratios of Fustic Extract, copperas and bluestone is the one generally used in the production of pure black dye.

The blacks produced by the above formulae are full, rich blacks, and, as one of your recent speakers said, have never been matched by any simple dyestuff. It can also be said that by the use of logwood in the above methods the physical characteristics of the silk have been improved with an added weight.

Logwood as a Weighting Agent

We now come to one of the most interesting phases of the application of logwood to silk, namely, its value as a weighting material. As stated before, the consumption of logwood has increased tremendously since the time Heermann and Weidmann published their works on the use of logwood on tin-phosphated silk.

Prior to the development of the use of logwood on tin-phosphated silk, the processes for the production of heavy weighted black silk were most complicated and involved the use of iron, also tin, in the form of stannous chloride in combination with tannin extracts. These methods also necessitated the silk being handled quite frequently and required considerable experience. I have seen formulae for the production of weighted blacks which required eight distinct baths. It is true that by the use of these old processes it was possible to weight silk from 300 to 400%. It is obvious that the costs of these various old-time methods were very high.

Although logwood was used in these processes, the finished weighted silk had a high percentage of mineral matter. To-day our efforts are directed to the production of weighted silk wherein the mineral content is reduced to a minimum. This in a measure can be accomplished by adjusting the tin-phosphate process in conjunction with the use of special manufactured logwood products, which would produce a black silk in which the tensile strength of the fiber would be increased and the feel improved; or, in other words, in place of excess mineral matter with its deteriorating action, our research is toward the production of weighted silk containing less mineral matter and more organic matter and at the same time improving the physical characteristics of the finished silk. This, of course, applies to black weighted silk in which logwood is used.

When raw silk is boiled off, or degummed, it loses about 25 to 30% of its weight and the object of weighting is to compensate for this loss and even go further and produce an additional weight over its original raw weight.

The early silk dyers found that degummed silk could absorb metallic salts and also tannins, and eventually evolved processes whereby advantage was taken of the black iron lakes in the silk fiber. They further found that this black could be improved by topping with logwood. For example, the degummed silk was treated alternately in an iron bath, then in a tannin, or in some cases a soap bath. These operations would have been repeated in some cases as often as seven times, but as mentioned before processes such as these have been more or less abandoned.

In the modern method of producing weighted blacks, the tin-phosphate process is that generally employed. This process consists of treating the degummed silk in in stannic chloride solution at 53° Tw. for one hour cold, then washing in cold water and entering into a bath of disodium phosphate at 9° Tw. and at a temperature of 150° F. for one-half hour. The silk is then thoroughly washed in warm water. This completes what is known as "one-pass" tin silk. The operation is repeated again for a "two-pass" silk, and again for a "three-pass," and occasionally a "four-pass" silk is produced. It is interesting to note the weight gained by the silk with each pass.

100 pounds raw silk yields
equals 73 pounds boiled off (degummed)
which produces 86 pounds one-pass tin silk
or 105 pounds two-pass tin silk
or 125 pounds three-pass tin silk
or 150 pounds four-pass tin silk

The chemistry of tin weighting is still a subject of debate. Some writers claim that the silk absorbs the stannic chloride, which in washing is converted into oxychloride and subsequently into stannic acid, and in the treatment with the hot phosphate tin phosphate is formed in the fiber. Other writers claim that colloidal stannic hydrate is produced in the fiber. At any rate, it is a fact that, as simple as the process may seem, there are possibilities of the formation of various tin compounds in the silk having different affinities for logwood extract. In order to obtain a uniform and correct type of tin-phosphated silk for logwood weighting, it is necessary in its preparation that the following rules should be strictly adhered to:

1. Boiling Off.—The degumming process must be thorough so that no trace of silk gum is left in the fiber.

2. All traces of soap used in the degumming process must be removed.

3. The gravities, temperatures and chemical constitutions of the tin and phosphate baths must be carefully controlled.

4. Washing.—The washing operations must be complete and the temperature and degree of hardness of these wash waters be correct. If these precautions are not noted, types of tin-phosphated silks are produced which lack luster and have a reduced affinity for logwood. It is readily seen, then, that through carelessness in preparing tin-phosphate silks for logwood weighting irregular results are sometimes obtained. Due to such carelessness, we have known dyehouses to use the same class of silk and subject it to the same number of tin passes and use the same logwood product to obtain marked differences in the weight and character of the finished goods.

It is also a recognized fact that there are valuable trade secrets in connection with tin-phosphating of silk which are carefully guarded.

It might be asked, Why dwell so long on this question of tin-phosphating? It might be answered with another question: Why build a house without a good foundation? The manufacturer of logwood products is interested in the consumer's obtaining the full economic value of his goods, and it is from this standpoint that he strives to make an extract which will meet the needs of this particular class of work.

Control in Logwood Manufacture

The selection of raw material (wood) for the manufacture of logwood extract for silk weighting is a very important one. From the different varieties of logwood available in commerce the manufacturer must know what type of wood to use. It is a known fact that certain logwoods produce extracts having low silk-weighting values, and others having, on the contrary, high values.

Aside from the importance of the selection of raw material, it is equally important that the manufacturer bear in mind under what conditions the extract is to be used. He is therefore compelled to carefully control his various operations from the time the wood is chipped, ready for extraction, to the final processes, so that the finished goods will produce the desired results in the dyehouse. It is imperative that his product be of high purity and good solubility, otherwise the breaking of the soap bath in the weighting process would be a certainty. If breaking occurs in the soap bath, the dyer is faced not only with dirty material smeared with fatty acids, but the weighting he obtains is very much below normal.

The method of using logwood on tin-phosphated silk is as follows: The prepared material is entered into a concentrated bath containing dissolved logwood extract or crystals and olive oil soap. This bath is maintained, if possible, at the boil for two hours. The goods are then washed thoroughly.

By this process the tin-phosphated silk absorbs approximately 20 to 70% of its weight, depending on the type and amount of logwood used—or, in other words:

100 pounds of raw silk, boiled off and subjected to "one-pass" tin phosphate and using 50 pounds of logwood crystals would produce approximately 120 pounds of tin-phosphated logwood silk; or

100 pounds of raw silk, boiled off and subjected to "two-pass" tin phosphate and using 50 pounds of logwood crystals, would produce approximately 145 pounds of tin-phosphated logwood silk; or

100 pounds of raw silk, boiled off and subjected to "three-pass" tin phosphate and using 50 pounds of logwood crystals, would produce approximately 160 pounds of tin-phosphated logwood silk.

By increasing the logwood crystals in this last example to 100 pounds we can produce a weighted silk of approximately 200 pounds.

The shade produced after passing through the logwood bath is of a plum color, which is converted to a black either by topping with basic dyestuffs, such as Methylene Green and Chrysoidine, or by oxidizing the tin phosphate logwood lake produced in the fiber with an acidified nitrite of soda solution and further topping with hematine. In some cases additional weight is added to the tin-phosphated logwood silk by dyeing it in a bath of hematine and soap—or, before entering

into the hematine bath, the tin-phosphated silk may be treated in a gambier or other tannin material bath and then be put into an iron bath.

Absorption of Weighting Material

In the use of logwood extracts in the weighting of tin-phosphate silk it might be of interest to note that the silk absorbs a definite amount of weighting material from the logwood extract. There is a maximum absorption beyond which any additional amount of logwood extract in the dye bath is not only useless but harmful, as this excess amount tends to strip off the fiber some of the already absorbed weight. The maximum amount of logwood absorbed as weighting varies with the type of tin-phosphate silk used—whether it is one, two or three pass. This is better illustrated by the following tables:

1. For a one-pass silk—using 100 pounds raw silk:

Logwood Crystals		Silk
25 pounds	give	104 pounds
50 pounds	give	117 pounds
100 pounds	give	88 pounds
150 pounds	give	86 pounds

2. For a two-pass silk—using 100 pounds raw silk:

Logwood Crystals		Silk
25 pounds	give	112 pounds
50 pounds	give	135 pounds
100 pounds	give	128 pounds
150 pounds	give	93 pounds

3. For a three-pass silk—using 100 pounds raw silk:

Logwood Crystals		Silk
25 pounds	give	140 pounds
50 pounds	give	160 pounds
100 pounds	give	200 pounds
150 pounds	give	189 pounds
200 pounds	give ...	154 pounds

In these experiments the type of crystal used was one sold in the market for silk-weighting purposes, and in each set of experiments the same quality of raw silk was used and the same percentage of soap—namely, 100% on the weight of the raw silk.

The question as to the influence of the amount of soap used in these experiments might arise. We therefore conducted another series of experiments in which another grade of logwood crystals for silk weighting was used, and instead of using 100% soap on the weight of the raw silk we used 100% of soap on the weight of the crystals used in each case, from which we obtained the following results—based on 100 pounds of raw silk and using a two-pass tin silk:

Logwood Crystals	Percentage Soap	Final Weight of Silk
60 pounds	60 pounds	140 pounds
70 pounds	70 pounds	150 pounds
80 pounds	80 pounds	151 pounds
90 pounds	90 pounds	156 pounds
100 pounds	100 pounds	140 pounds

From this table it will be seen that, in spite of the fact that the quantity of crystals used was balanced by the quantity of soap, a saturation point was reached beyond which there was a decrease in the weighted silk.

Although we know that soap is necessary in tin-phosphated logwood weighting, any excess used has no beneficial effect so far as increased weighting is concerned. This is illustrated by the following experiments—based on 100 pounds of raw silk and using two-pass tin silk: 50 pounds logwood crystals, 50 pounds soap, give 135 pounds silk; 50 pounds logwood crystals, 100 pounds soap, give 135 pounds silk.

Along the same lines, the same experiment using three-pass silk and the same quantities of crystals and soap: 50 pounds logwood crystals, 50 pounds soap, give 160 pounds silk; 50 pounds logwood crystals, 100 pounds soap, give 161 pounds silk.

Now, what is the action of the soap in our weighting process? This has yet to be satisfactorily explained. It is thought by some to hydrate the tin logwood lake formed in the fiber. At any rate, we know that if no soap is used in the weighting process we obtain only about 60% of the weighting value of the logwood product.

The other important factors in the logwood weighting process are the time of dyeing and the temperature of the logwood weighting bath, and also the concentration of this bath. Experiments carried out have shown that for best results two hours' dyeing is necessary, and the temperature of the dye bath must be kept as near as possible to the boil.

Whence Comes the Weight?

As mentioned before in discussing the chemistry of logwood, we are still faced with the problem, Why does logwood extract weight silk to the extent that it does? It has been established that 75% of the solid matter in the special weighting extracts is absorbed by the tin-phosphated silk, and it is also known that only 53 to 55% of the solid matter is considered to be hematoxylin, the coloring principle of logwood. Yet chemically pure hematoxylin has only 60% of the weighting property of dry logwood extract. We also note that logwood extract contains tannins, and it is

possible that these tannins act as the weighting matter in logwood. Investigations made of all tannin materials of a pyrogallol and catechol nature have shown us that tannins have not the weighting properties of logwood when applied to tin-phosphated silk. In fact, some have a stripping action. Are the weighting properties of logwood due to a combined physical and chemical action? Thorough as our investigations have been, we have yet to find a material, be it organic or inorganic, that has the valuable properties not only as a weighting material but also for its beneficial effect on the fiber.

We omitted to mention that, in our further studies to improve the weighting properties of logwood, the effect of oxidizing the coloring matter has shown us that the more a logwood extract is oxidized the more its weighting properties are reduced; but, strange to say, a logwood product can be oxidized to 100%, yet its weighting value is greater than the chemically pure coloring principle of logwood (hematoxylin).

It is in this last observation that the manufacturer must guard against any natural or artificial oxidation during the manufacture of extracts for silk weighting. Attempts have been made to reduce the natural oxidized coloring matter in the wood, with a view to increasing its weighting value. These experiments so far have produced negative results.

We have endeavored in this paper to emphasize the importance of scientific control in the manufacture of logwood products for the silk industry, so that products can be made to meet the requirements demanded of them, whether for silk dyeing or weighting. Like any other progressive industry, those engaged in the manufacture of logwood extract are constantly striving, through their research departments, to improve their products, and also to improve their methods of application. By the co-operation of the manufacturers of logwood extracts and the silk-dyeing industry much has been accomplished in the past. There is considerable research work still to be done and the results derived from it will be of mutual benefit.

Discussion on Logwood

Chairman Knowland—Inasmuch as there are two more papers to be read and no doubt many of you here would like to ask some questions, I am going to ask that you put your questions as quickly as possible, so that everyone here can enjoy and get all possible benefit from the discussion.

E. F. L. Lotte—Logwood was extracted by dyers before the time when, as you mentioned, the logwood was hung in tanks and boiled out. I would say that in between the time that the extract was developed and the time that logwood was boiled in bags, the coloring matter from the chips was extracted in iron extractors with steam at about 40 pounds pressure, to which was added some sal soda in order to get some bettering coloring. Probably I am one of the old members here, and that is just a little bit of history that I thought I would give you.

Chairman Knowland—Thank you, Mr. Lotte. Are there any further questions?

Louis L. Fidelgoltz—In connection with the basic color that is used after the logwood is put on the tin-weighted silk, I think there is a particular type of Methylene Blue which works as well as Methylene Green and does not crock. Could you tell me what that is?

E. Zillessen—In my experience the crocking depends a great deal on the amount of soap used. If there isn't enough soap used, a fatty acid develops in the bath and it crocks.

Louis L. Fidelgoltz—If you use Methylene Blue you will find that it crocks, but there is a particular type of Methylene Blue that gives as satisfactory results as the Methylene Green. I have experienced that.

Chairman Knowland—Is there anyone here who can answer that question?

P. J. Wood—It might be that the zinc-free type might have something to do with it.

Chairman Knowland—No.

Samuel Klein—I believe there was a slight error in Mr. Wallace's reading of his paper. He said Chrysoidine and Methylene Green. Would you use Methylene Green as it is or a combination of Methylene Green and Chrysoidine?

Mr. Wallace—In some cases a combination of both is used.

Mr. Klein—At the present time there are very few using Methylene Green alone; most dyers are using a combination of Methylene Green and Chrysoidine.

Chairman Knowland—Are there any further questions?

Our next speaker probably doesn't need any introduction to you Paterson folks. However, there are a great many here from New York who probably don't know him. It gives me a great deal of pleasure to introduce C. F. Hoppe, of the Oriental Silk Printing Company, who will speak on "The Preparation and Printing of Silk Warps." Mr. Hoppe! (Applause.)

C. F. Hoppe—Mr. Chairman and Gentlemen: It gives me great pleasure to see your organization so well represented in Paterson to-night, and I am sure that under the leadership of your able Chairman at the next meeting in Paterson you will have even a larger attendance.

. . . Mr. Hoppe read his paper as follows:

Proceedings of the American Association of Textile Chemists and Colorists

The Preparation and Printing of Silk Warps

By C. F. Hoppe
Oriental Silk Printing Company

THE past print season has been one in which warp prints for the tie silk trade have been quite in demand. The style of the patterns have been very much the same as in the past, but the colorings have been confined to a large extent to the monotone effects which are very effective in jacquard designs. It seems that patterns and styles repeat every few years; that may apply mostly to the novelties, to which class we may include warp printing, but it is also marked in regular piece goods printing by such patterns as Persians, polka dots and various styles of stripes.

No doubt many of you do not know of the great care and special attention which must be given to the processing of silk warps, so I will endeavor to give you a brief outline of this process though it is in the greater part mechanical. It is entirely different from regular surface printing, for when we deal with the delicate silk fibers of the warp there is nothing but utmost caution will prevent a warp from being damaged to such an extent as to be totally worthless.

The Demand for Warps

In the past year the demand for warps in the tie silk trade has surpassed all other seasons for quite some time back. Warp printed taffetas have also been quite in vogue. The tie silk manufacturer has one great advantage, that of assortment. From one printed warp in one color combination he very often makes a dozen or more different jacquard designs, which changes the entire appearance of the printed pattern. The slightest change of the shade of the filling or a small alteration of the construction of the fabric very often changes the characters of the design to such a degree that the printer would not be able to identify the pattern as one he has printed.

These samples which I am going to pass for your examination give some very good examples of the change of design made by weaving. These larger samples are some cuts of warp-printed taffeta. You might note the softness of the design and the colors, which cannot be produced by any other method of printing. These samples show the exact effect desired.

On the tie silk swatches, the smaller one, marked No. 1, is a printer's strike-off on white silk piece goods of the colorings which were printed on the warp. The larger sample marked No. 2 is the printed warp after being woven. I would like you to pay particular attention to the samples marked in which you will see that the original pattern is completely lost but that the print colors together with the filling are iridescent, which is the effect desired.

Great care in the preparation of the warps for printing is most essential in producing first-class merchandise. Some of the larger manufacturers prepare their own warps while others have them made up by the warping and binding concerns specially equipped for this kind of work. When making the warp, great care should be taken in getting an even tension in all the threads so that none is tighter than others; this must be the case not only in each section, but in all sections separately, so that the entire warp will have the same tension throughout and there will be no loose threads to hang down or spread in processing, which would cause white spaces or perhaps a separation of the design.

Care in Binding

The silk used is usually of pure dye but a small percentage of weighting is permissible. If weighted, however, it is not wise to go beyond 15 ounces, and it must be dyed by the skein dyer for the purpose of warp printing alone. To insure good printing the warps should not be over 330 yards in length, the reason for this being that during the process of steaming the steam must completely penetrate the warp to insure evenness of shade.

The object of binding is to keep the threads of the warp from moving between the time when the warp is processed by the printer and when it is finally woven out. The silk used for binding should be of pure dye organzine. There should be at least eight picks in about one-quarter of an inch; better still would be the employment of a zig-zag thread interwoven from one binder to another, which would not allow the pattern to shift to any great extent, although slight shifting produces a more or less desirable effect, depending, of course, on the pattern and style of the finished fabric. The distance between each binder should be from one to two yards. It is extremely necessary that no loose threads or waste of any kind cling to the warp, as this may cause imperfections in printing over which the printer has no control.

There should be a six-inch heading at each of the warp woven in so as to attach the endcloth thereon. The quantity of warp papers used plays a very important part in processing as they tend to hold the warp firm and even. These papers are usually placed at intervals of 8 to 10 yards. They should be free from any grit or oil.

For the discharge printing of warps special attention must be paid to all instructions, due to the tremendous passage through the ager. The selection of the proper direct dischargeable colors by the skein dyer is a very important factor in this instance; all colors must discharge a pure white and not return during the steaming, although during the steaming a white discharge does be-

come a trifle yellowish but not to such a degree as to be objectionable.

The printer, unless special fastness properties are required, uses the brightest type of acid and basic colors so as to insure the proper strength and shade of color to the finished material. This excessive brightness is required because the weaving in of the filling has a tendency to diminish the tone and luster of the colors. The colorist matches his colors on a strike-off of plain white pure dye silk; these colors are somewhat modified after weaving as the samples will indicate. I might mention, at this time, that the depth of engraving is about the same as for the regular surface printing of silk piece goods.

Control of Tension

The actual printing requires a special rigging on which the warp can be held at the greatest tension possible without injury to the fibers. On the rear of the print machine we have a specially constructed framework in which the warp is placed and upon which the tension can be so regulated as to insure evenness of tension throughout, for the least bit of unevenness may distort the pattern while in the process of printing, and it cannot thereafter be straightened owing to the elasticity of the silk fibers.

After the warp passes through the print machine it is dried in the usual manner, that of passing through the drying chamber just above the print machine, which is heated by a series of coils, then passing on to the take-up roll at the rear, with the necessary warp papers inserted. The warp is then ready for the steaming, or as is the case with discharge warps, the ager.

Warps printed by this method of application are rolled on a reel between cheesecloth and entered into the cottage steamer for three-quarters to one and a half hours, depending upon the type of dyestuff used. During the steaming process the warp is occasionally turned by a set of gears with a revolving handle extending to the interior of the cottage.

After steaming, the bundle containing the warp is placed on an expansion reel to keep the same even tension and run over a set of drying cans upon a shell at the rear. The tightly beamed warp is then ready for the washing process, which is done either on a continuous washer or in the cheesecloth bundle before rebeaming. If the warp is to be washed in the cheesecloth bundle it is placed in a wooden crib and the water allowed to flow through the bundle until the silk fiber is free of the printing gum, making it pliable and easy to weave.

The last operation is that of straightening the pattern by running it over a long frame, from shell to shell, the binders being held in place by a clamp set up on a movable carriage which slides along the framework with a high tension, regulated by a series of brakes operated by the beamer. This being the final operation, the warp papers are inserted every six yards to insure the warp's being tightly beamed and as a prevention against slipping in the loom. It is then ready for the manufacturer to enter in his loom.

Many of these minor details seem like unnecessary precautions for the printer, but they are absolutely essential in the production of high-grade printed warps.

Chairman Knowland—Are there any questions that you would like to ask Mr. Hoppe?

Mr. Stein—The warps are very heavy; the gentleman said the warps should be about 300 yards. If warps are especially heavy, isn't that very long? Wouldn't 120 or 180 yards be better?

Mr. Hoppe—One hundred and eighty yards would be better, but the tie silk trade demand warps of about 320 yards in length.

Mr. Wolstenholm—I would like to ask whether it is necessary for the tie silk trade to have their warps washed in order to make the weaving process easier?

Mr. Hoppe—It is not always necessary that the warps should be washed. It seems that the gum used in printing is pliable, but in some instances the warps must be washed to free them of the printing gum.

Mr. Wolstenholm—May I ask the process of washing them?

Mr. Hoppe—The warps are washed in wooden cribs; a continuous flow of water passes through the cheesecloth filter, freeing it of the gum.

Chairman Knowland—Are there any further questions?

We have listened to two papers on the production of silk materials as they leave the plant, and now we are going to look at a totally different angle of how textiles are handled after leaving the plant. It will be interesting to hear some of the remarks from our next speaker with reference to textile materials as they are passed over the counter of a retail store. It gives me great pleasure to introduce to you Mr. E. Freedman, of R. H. Macy & Co., New York. Mr. Freedman! (Applause.)

. . . Mr. Freedman read his paper as follows:

A Proposed Method for Describing Washable Materials and Garments

By E. Freedman

Director, Bureau of Standards, R. H. Macy & Co.

JUST about one year ago, or on February 24, 1928, to be exact, we gathered in this very hall and discussed the examination of textiles from the retailer's point of view.

About two weeks ago I was privileged to tell the

Consumers' Club of the activities of Macy's Bureau of Standards. One of the ladies asked some pertinent questions. She wanted to know—Were all garments washable; were they guaranteed; why couldn't buyers see to it that all garments were washable, and how could the public be assured that they were washable. She even went farther. She thought that a customer should be permitted to cut a swatch of material from a garment and subject it to test before deciding upon a purchase.

Now, most of us agree that her last question points to an impractical solution, to say the least. But the others represent an ever-increasing number of questions of like tenor, indicating a steady and not-to-be-denied wave of public opinion. The consumer, in our estimation, is becoming more discriminating in her purchases, more discerning as to values and more critical as to performance.

We have devoted a great deal of time and study to the subject of washability. Soap and textile manufacturers, dyers and finishers, garment makers and retailers, better business bureaus, and laboratories connected with many schools and colleges have given this problem serious consideration. The February 5 issue of the Macy Bureau of Standards Bulletin No. 21 was devoted to the subject of washability. I shall read from this bulletin, and also from our Bulletin No. 22.

Before doing so, however, I will say that as this is merely offered by our Bureau of Standards to R. H. Macy & Co. as a possible solution to the washability problem, I would not want anyone to interpret this presentation of or contents of the paper as a plan that has been accepted by R. H. Macy & Co., but rather as a plan submitted by our Bureau of Standards for Macy's consideration.

And so I would ask that you take this plan as coming from one member of your Association to the rest of us.

WASHABILITY

A Proposed Method for Describing Materials and Garments

The Ambiguity of "Washable."—"Is a garment washable?" "What is meant by the term '*washable*'?" "When is material washable and when is it not?" "How can one determine whether anything is washable?" These and many other similar questions are forever being asked, and the answers are legion. It seems that everyone places his own interpretation upon the poor abused though highly important (from the consumer's point of view) subject of washability, taking particular delight in using terms as "washable," "wash-fast," "tub-fast," etc., without, in many instances, any rhyme or reason.

Extent of Progress.—During the past year the subject of washability has been given serious consideration by numerous agencies. The Research Committee of the American Association of Textile Chemists and Colorists, after considerable experimentation, has evolved a series of tests by means of which materials are classified as to different degrees of fastness to washing, scouring and laundering. These tests are exceptionally well adapted for laboratory use. At the same time they closely duplicate results obtained by commercial and home laundering methods.

Unintentional Discrimination Against Classes of Materials.—The tests used by this Association are known as Tests 1, 2, 3 and 4. Materials are classified as follows: Class 1, excellent; Class 2, very good; Class 3, good, commercially fast; Class 4, fair; Class 5, poor. Only those materials withstanding Test 1, which calls for washing at the boil (212° F.), shall be "guaranteed fast to washing." The majority of materials do not come under this class and, furthermore, it is not necessary for them to withstand this rigid test. Their scheme of classification discriminates against most silks, woolens, rayons and almost the entire class of colored and print goods, irrespective of their composition.

Ambiguity of Phrases Now in Use.—To the retailer, and to the consumer, these classes cannot mean very much, because of the ambiguity of the phrases "very good," "good; commercially fast," "fair," "poor."

Our Bureau of Standards believes it has a simple solution to this problem which should prove satisfactory to all parties concerned, from manufacturer to consumer.

Defining Washability.—The first essential step is to define "washability." Our definition of "washability" is the ability of material to satisfactorily withstand laundering under standard conditions. It follows, then, that any materials coming under this category would be termed "washable." Since materials either do or do not wash satisfactorily, depending upon the method employed, a definition of "washable" should be dependent upon a method of laundering.

Three Methods Evolved.—Three methods of laundering have been evolved for all materials, based on some of the tests now advocated by the Association. We can now describe and label material as being washable according to Method 1, 2 or 3. The advantages to be gained by this procedure are obvious. Our proposed plan places all washable materials on an equal plane. With this in mind, we will now proceed to define "washable."

For Commercial Laundering.—"*Washable (Method 1)*"—if when washed in a standard alkaline soap solution at 160° F. for thirty minutes, followed by standard

bleach treatment (sodium hypochlorite solution containing 0.01% of available chlorine for ten minutes at 160° F.), rinsed in tepid water and immersed in an 0.05% acetic acid solution for ten minutes at 105° F., and then rinsed in tepid water and dried in a current of air at ordinary temperature, no noticeable staining, alteration in color, appearance, or appreciable shrinkage (not more than 5%) is apparent.

For Ordinary Home Laundering.—"Washable (Method 2)"—if when washed in a standard alkaline soap solution at 160° F. for thirty minutes, then rinsed in tepid water and dried in a current of air, no noticeable staining, alteration in color, appearance, or appreciable shrinkage (not more than 5%) is apparent.

For Careful Washing.—"Washable (Method 3)"—if when washed in a standard neutral soap solution without rubbing or twisting, at wrist temperature (98.6° F.), rinsed in water at wrist temperature and dried quickly in a current of air, between towels, shaped to size, or on forms, as recommended in individual instructions applying to these fabrics, there is no staining, noticeable alteration in color, appearance, or appreciable shrinkage (not more than 5% except for knitwear, where a 10% maximum shrinkage or 5% elongation [stretch] is permitted) is apparent.

Ironing.—Whether under Methods 1, 2 or 3 all materials must iron satisfactorily by moderately warm, warm or hot iron as recommended for the individual materials.

Definitions.—"Neutral Soap Solution" is a solution of neutral chip soap (Lily White Flakes, Ivory Flakes, Lux, Fab, etc.). "Alkaline Soap Solution" is a neutral soap solution to which has been added 0.2% anhydrous sodium carbonate. By "washable" garments is meant not only the material but also all trimmings, including sewing thread, embroidery, piping, linings, etc.

Apparatus and Technique Recommended.—The standard machine to be used for conducting laboratory washability tests is the Launder-Ometer. The technique used, unless otherwise directed by Method 1, 2 or 3, shall be that recommended by the Association.

We are now ready to recommend a fourfold plan for putting this method into operation. It embraces: (1) Directions for purchasing; (2) labeling of merchandise; (3) instruction of sales force; (4) instruction and education of the Macy buying public.

It is recomended:

1. (a) That purchase orders specify that merchandise delivered be *Washable, Method* 1, 2 or 3 as the case

CHART NO. 1—CIRCULAR FOR VENDORS

WASHABLE (METHOD 1)

For Commercial Laundering

If when washed in a standard alkaline soap solution at 160° F. for thirty minutes, followed by standard bleach treatment (sodium hypochlorite solution containing 0.01% of available chlorine for ten minutes at 160° F.), rinsed in tepid water and immersed in an 0.05% acetic acid solution for ten minutes at 105° F., and then rinsed in tepid water and dried in a current of air at ordinary temperature, no noticeable staining, alteration in color, appearance, or appreciable shrinkage (not more than 5%) is apparent.

Drying Instructions

Dry quickly in current of air
Dry between towels.

Ironing Instructions

Iron with moderately warm iron.

WASHABLE (METHOD 2)

For Ordinary Home Laundering

If when washed in a standard alkaline soap solution at 160° F. for thirty minutes, then rinsed in tepid water and dried in a current of air, no noticeable staining, alteration in color, appearance, or appreciable shrinkage (not more than 5%) is apparent.

Drying Instructions

Do not dry directly in sun.

Ironing Instructions

Iron with warm iron.

WASHABLE (METHOD 3)

For Careful Washing

If when washed in a standard neutral soap solution without rubbing or twisting at wrist temperature (98.6° F.), rinsed in water at wrist temperature and dried quickly in a current of air, between towels shaped to size, or on forms as recommended in individual instructions applying to these fabrics, there is no staining, noticeable alteration in color, appearance, or appreciable shrinkage (not more than 5% except for knitwear, where a 10% maximum shrinkage or 5% elongation [stretch] is permitted) is apparent.

Drying Instructions

Place on form and hang to dry.
Spread flat, shape, and dry between towels.

Ironing Instructions

Iron with hot iron.

Definitions

"Neutral soap solution" is a solution of neutral chip soap (Lily White Flakes, Lux, Ivory Flakes, Fab, etc.). "Alkaline soap solution" is a neutral soap solution to which has been added 0.2% anhydrous sodium carbonate. By "washable" garments is meant not only the material but also all trimmings, including sewing thread, embroidery, piping, linings, etc.

Apparatus and Technique Required for Carrying Out Above Tests

The standard machine to be used for conducting laboratory washability tests is the Launder-Ometer. The technique used, unless otherwise directed under Method 1, 2 or 3, shall be that recommended by the American Association of Textile Chemists and Colorists.

CHART NO. 2—WASHING INSTRUCTIONS FOR CUSTOMERS

WASHABLE (METHOD 1)

This — { Article / Material / Garment } is guaranteed to be WASHABLE if laundered according to this METHOD.

Directions: Dissolve thoroughly any good grade of soap, soap powder or soap flakes in hot water. Use enough soap to produce rich suds. DO NOT BOIL. Water just starting to steam (160° F.) is sufficiently hot. Rub as much as necessary. When washed in a commercial laundry, a standard bleach treatment for ten minutes at 160° F., followed by rinsing in tepid water and immersion in a 0.05% acetic acid solution for ten minutes at 105° F., may be given if required. This is to be followed by rinsing in tepid water (wrist temperature). Dry in current of air at ordinary temperature, and iron as directed below.

*Dry .....
*Iron .....

Remarks—If directions are followed, this article will not stain, alter in color or appearance, or shrink appreciably.

WASHABLE (METHOD 2)

This — { Article / Material / Garment } is guaranteed to be WASHABLE if laundered according to this METHOD.

Directions: Dissolve thoroughly any good grade of soap, soap powder or soap flakes in hot water. Use enough soap to produce rich suds. DO NOT BOIL. Water just starting to steam (160° F.) is sufficiently hot. Rub as much as necessary. Rinse thoroughly in tepid water (wrist temperature) and dry in current of air at ordinary temperature. Iron as directed below.

*Dry .....
*Iron .....

Remarks—If directions are followed, this article will not stain, alter in color or appearance, or shrink appreciably.

WASHABLE (METHOD 3)

This — { Article / Material / Garment } is guaranteed to be WASHABLE if laundered according to this METHOD.

Directions: Dissolve thoroughly "neutral soap," such as Lily White Flakes, Ivory Flakes, Lux or Fab, in hot water and add cold water until wrist temperature (98.6° F.) is reached. Use enough soap to produce rich suds. Wash article as quickly as possible without rubbing or twisting. Rinse thoroughly in clear water at wrist temperature. Dry and iron as directed below. Do not dry directly in sun.

*Dry .....
*Iron .....

Remarks—If directions are followed, this article will not stain, alter in color or appearance, or shrink appreciably.

Shrinkage: For woven material, up to 5% is considered permissible; for knitwear, up to 10% is considered permissible.

Method Recommended

**State which ironing and drying methods are to be used.*

Dry quickly in current of air.
Dry between towels.
Iron with moderately warm iron.

Iron with warm iron.

Place on form and hang to dry. Spread flat, shape, and dry between towels.
Iron with hot iron.

may be, and that incoming invoices contain a guarantee of *washability* by one of these methods; (b) That a circular entitled *"Washability"* in which the *Methods* of testing are described, accompany the purchase orders.

2. (a) That merchandise be clearly marked, by stencil, label, tag or otherwise as *Washable (Method 1)* or *Washable (Method 2)* or *Washable (Method 3)*; (b) That instructions such as shown on accompanying chart be prepared for distribution with the merchandise.

3. That the salesforce be thoroughly instructed as to the meaning of *washable*, and further that they be cautioned never to offer anything for sale as *washable* without including in their statement the *method* as 1, 2, or 3.

4. (a) That a guarantee, and specific Washing Instructions accompany all *washable* merchandise sold to the public; (b) That the public be fully notified by means of newspaper advertisements and countersigns as to the terms *"Washable."*

The plan we have in back of this is to remove the ambiguity attached to the term "washable," to place all materials on an equal plane, because at the present time, I believe, there is a certain amount of discrimination placed against colored goods, against many prints; they are given class numbers, and there is always some reaction against the use of classes. The Association calls a Class 5 material "poor"; but when you say "good" or "fairly good" the customer is likely to think that there is somethong wrong with it, and I don't think that it is quite fair to the entire industry.

I believe the proposed plan which we have just submitted--that is, the proposed plan which we would like R. H. Macy & Co. to adopt—should be well received in all quarters. Our definitions, I believe, are quite clear; the methods employed are not drastic; and, as I said before, it places all materials in the textile industry that are washable on an equal plane.

It might interest you to know that we had a piece of knitted wear—in fact, it was an undergarment—submitted to us to-day, and the customer complained that it was too small for her after she had washed it. It

shrank 18 per cent in length and almost 14 per cent in width. I don't doubt that every one of you will agree with me that that customer was absolutely justified. (Laughter.)

We have had other materials that were not knitted, such as woven cloths, that have also shrunk to a considerable degree.

I would also like to say that I think we have been rather lenient in placing a maximum of 5% shrinkage on woven material and 10% on knitwear, but I am rather optimistic. To begin with, we would consider that type of goods the poorest quality, should this method be adopted, but I feel that by an evolutionary method of thought the shrinkage problem can well be taken care of.

You may also note that we have eliminated bleeding, which, I believe, has been remarked upon in other washing methods, provided a sample of material or the dyestuff on a sample does not deleteriously affect any other material with which it comes in contact. In my estimation bleeding is immaterial, because you can readily enough detect the amount of fading of the material by the eye; that is, to find out whether or not it is fading more than it should.

I think that covers the subject pretty well. (Applause.)

Discussion on Washability

Chairman Knowland—Are there any questions you would like to ask Mr. Freedman?

R. Fitzgibbon—Mr. Chairman, when I first heard you telling who the speakers were to be and I read about Mr. Freedman of Macy's being scheduled to talk about wash goods, I thought perhaps the members here would be interested in hearing about a machine that was made by one of our members for conducting wash tests.

When we were in Providence at the general meeting, one of the main exhibits, or, I think, the only exhibit, was this Launder-Ometer. I saw this machine first about four or five years ago; that one was constructed by Dr. Oscar Flynn, of the Waldrich Bleachery. The principle is the same as that of the Launder-Ometer. This machine was a long box that was filled with felt and was constructed to make a dozen wash tests at once. In the felt there were cabinets constructed or cut out to put Mason jars in. The difference between his machine and the latest machine is that the latest machine uses metal balls and Dr. Flynn used shot. The Beebe shot being smaller, it gives a very effective result. He put these jars in the box, which was on a shaft and run by a motor. He had a piece of cloth to make a test, to see that the wash tests were satisfactory and had been given a sufficient length of time. That piece of cloth was saturated with lampblack. Whenever the cloth with the lampblack on it was cleaned, then he would know that he had given a very satisfactory wash test in this machine.

Of course, it may be out of order now, but at the same time I thought you would like to hear about it, and I might say that a young lady who came from Washington to look over the various types of machines from the Domestic Science Department saw it and she thought it was a very excellent machine. I believe it antedates the new machine, and I would suggest that Dr. Flynn send it along to the British Museum with Mr. Wright's first aeroplane, or something like that.

But the main point, gentlemen, is that it shows that one of our members, long before this new machine had been invented and brought out, had made serious efforts to control wash tests, and if some of you members who get around to the plant looked at it you would see it was a very ingenious and a very satisfactory method of wash testing.

Chairman Knowland—Are there any further questions that anyone would like to ask?

Mr. Lotte—Mr. Freedman, could you recommend No. 1 for silks, on account of chlorine?

Mr. Freedman—That is the reason we say "method" rather than "class," because if it were tested with chlorine you could not put it in Class 1, if you called it "class," and that would immediately convey to the consumer that that was not as good as some other material. Therefore, Method 2 is used.

Mr. Lotte—What I meant to say was that you could not use chlorine on silk because that would be detrimental to the fiber itself.

Mr. Freedman—We recognize that fact and that is why we use the term "method" rather than "class."

Chairman Knowland—Are there any further questions?

Mr. Cohn—I would just like to ask Mr. Freedman, if they had a pattern printed and they wanted to wash it at a certain degree Fahrenheit, what would they do if the pattern had run out of style and they wanted to strip that stuff down to a certain extent or put a new pattern on their goods? Let us say, for instance, that they had 100,000 yards on the shelf and were not able to sell any more due to the pattern running out, what would they do with the surplus they had due to the new color they had to put on it?

Mr. Freedman—I think we would send that stuff to some of our good friends around Paterson, and I think they would be better able to answer that question than I am.

Chairman Knowland—Of course, a question like that is hardly a retail question. That is a manufacturer's job.

He is the one who carries the stock on hand nowadays, or tries to, if he can.

Are there any further questions?

P. J. Wood—I would like to ask a question and make a suggestion. In the first place I would like to know what "Lily White Flakes" are.

Mr. Freedman—You see, soap manufacturers have asked us when selling merchandise to customers to recommend some particular soap, because if we said "neutral soap," we would be talking through thin air, so we decided that as long as we were going to tell them what soap to use, we were going to include our own soap and we weren't going to be impartial to ourselves. (Laughter.)

P. J. Wood—One suggestion I would like to make is that is seems to me the very fact that you mention Methods 1, 2 and 3, rather implies a classification of "1" being superior, "2" somewhat inferior, and "3" quite inferior. Wouldn't it perhaps be better to call it "Laundry Wash," "Household Wash" and "Careful Wash" or whatever you wanted to call the other one, or "Particularly Careful Washing"? I think that would do away with the idea of any feeling that there was an inferiority implied by Methods 2 or 3.

Mr. Freedman—I am going to answer your other question first. I won't let you get away with that. You will admit, with me, that nationally advertised articles come first to the tongue, and so you might immediately think of one of the nationally advertised articles; and since charity begins at home, we believe in instructing our salesforce as to the merits of our own article first.

With regard to your suggestion, I believe there would be serious objection to the use of terms rather than numbers, because there is altogether too much ambiguity to terms, and if you say "Careful Wash" any man might come in and say, "Oh, yes, this washes; careful washing will take care of it all right." But when you pin him down to Method, 1, Method 2, or Method 3, you understand each other, and understand each other perfectly, and I do not believe that with the use of "Method" there is any discrimination because I defined "Washability" before, and possibly it would be best if I gave you our definition. I think that that would cover the situation quite well:

Defining Washability

The first essential step is to define "Washability." Our definition of "Washability" is the ability of material to satisfactorily withstand laundering under standard conditions. It follows then that any materials coming under this category would be termed "Washable." Since materials either do or do not wash satisfactorily, depending upon the method employed, a definition of "Washable" should be dependent upon a method of laundering."

Mr. Cohn—If a garment is sold that is being washable under Method No. 3 and the lady washes this garment under Method No. 2, will Macy's stand the loss or will it eventually come back into Paterson? (Laughter.)

Mr. Freedman—I really think that question is outside of my province because we have a very able Bureau of Adjustment that handles that end of it. I am concerned chiefly with the technical end of it and not with the relationship of Macy's with the customer; that is, the business relationship.

William Milne—May I ask Mr. Freedman what percentage of complaints he gets, irrespective of the method of washing, against goods that are sold as "washable"? You sell so many garments a day or yards of goods to individual customers that you sell as "washable." What percentage of complaints do you have against sales of goods that we have to stand?

Mr. Freedman—I am not prepared to answer that because those figures do not come to me. That would also be a Bureau of Adjustment question. But I will say that only too often we do have material brought to us, either garments or piece goods purchased by customers which were sold to them as "washable" and sold to us as "washable," that are not washable. I might add that not so long ago we had occasion to examine three pieces of material coming from one mill and they were sold to us as "washable." We conducted tests similar to those laid down by the Association and we found that they were not washable. The New York City agent insisted that they were, and he brought his superintendent and technical man down with him and we sat down and talked the thing over. They finally admitted that with that particular color or shade they were not able to get a washable material, but they thought they could get by with it if they called it "washable."

Mr. Lotte—Mr. Freedman, I just want to ask you concerning silks (because that is something in which we in Paterson are very much interested), if there were instructions given for washing silk whether that might help the sale of silks. In order to get better wear out of the fiber itself, all silks should be washed under your three methods, practically. If you heat silk or if silk is worn until it needs more than No. 3, then your silk suffers so far as the wear is concerned. If there were instructions given as to how to wash washable silks at wrist-warm temperature, then I think probably that would avoid some little of our class and would also give silks a place in which they could be sold as washable silks so long as they were washed under the instructions of washable silks; that is, they would either

be washable or not washable, and they would be washable under "wrist heat," as you call it, with your instructions as you gave them.

I merely make that suggestion because when you instruct anyone to go farther than that in the washing of silks, the fiber suffers, especially if they wash it several times. Silk washed at blood temperature or heat, at 98.6 to 100, will wear quite a long while and the silk will not suffer, even though weighted or not weighted, if such instructions are followed.

I think that silk should be put separately in your instructions for washing, and only one method used for washing of silks. That is merely a suggestion. Of course, I appreciate that when you get into rayons and cotton you need entirely different instructions, but it seems to me that that would be a better way. I am looking at it largely from the silk man's point of view, because we are largely interested in silk here.

Reason for Three Methods

Mr. Freedman—I understand your point of view; the reason we used the three methods is that we felt that, with you coming along with a brief for silk, possibly some other fiber manufacturer or class of manufacturer would come along with a brief for their particular fiber, and it might react against silk. That is the reason why we think that, all in all, the method proposition, forgetting about the fiber, is the best plan that can be evolved at the present time.

I would say that, so far as I can see, I agree with you thoroughly that silk should be washed at wrist temperature. We cut down the washing temperature from the method used in the Association Year Book from 105° F. to 98.6° F. The reason we have taken that temperature is that every housewife knows what wrist temperature is. She may not know what "blood heat" or "body temperature" is, but she knows what wrist temperature is. We can't talk degrees to the housewife, because many of them don't know how to use a thermometer, and the few who do know how to use one would rather play bridge. When we refer to 160° F., we also mention about the water becoming steam, because we know that they won't use a thermometer there.

Chairman Knowland—Are there any further questions? If not, have we anything further from our Executive Committee or our Secretary?

. . . A rising vote of thanks was given to the three speakers of the evening, and the meeting thereupon adjourned at 10:15 o'clock.

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MEETING OF RESEARCH BUREAU COMMITTEE

March 8, 1929

A MEETING of the Research Bureau Committee, appointed by President E. H. Killheffer, in accordance with vote of Council on January 18, 1929, was held at the Chemists' Club in New York City, Friday afternoon, March 8, 1929.

The meeting was called to order at 2 p. m. by President Killheffer, who is also president of the Newport Chemical Works, Passaic, N. J., and he appointed P. J. Wood, a vice-president of the Association and vice-president of the Oriental Silk Printing Company, Haledon, N. J., as chairman. Alex Morrison, Secretary of the A. A. T. C. C., and assistant chemist of the American Woolen Company, Andover, Mass., was elected temporary secretary.

The roll was called and the following in addition to the above three, answered as present:

W. D. Appel, chief, Textile Division, U. S. Bureau of Standards.

*Frederick L. Babcock, editor of Fibre and Fabric, and executive secretary of National Association of Textile Dyers and Finishers, Cambridge, Mass.

H. A. Barnes, superintendent, Proximity Print Works, Greensboro, N. C.

*Lincoln Baylies, president, National Association of Cotton Manufacturers.

Prof. Elmer C. Bertolet, Department of Chemistry and Dyeing, Philadelphia Textile School.

A. M. Burt, Celanese Corporation of America, Philadelphia.

Wm. H. Cady, chemist, Pacific Mills, Lawrence, Mass.

Dr. H. M. Chase, chief chemist and superintendent, Riverside and Dan River Cotton Mills, Danville, Va.

Hugh Christison, chemist, Arlington Mills, Lawrence, Mass.

*Clark, C. H., secretary-treasurer, Textile Research Council, and editor Textile World, Boston, Mass.

*M. D. C. Crawford, research editor, Daily News Record, New York.

Ralph F. Culver, vice-president and manager, Ciba Company, Providence, R. I.

Dr. R. B. Earle, chemist, United States Finishing Company, Providence, R. I.

Robert H. Gaede, Gaede Silk Dyeing Company, Paterson, N. J.

Dr. Jos. F. X. Harold, consulting chemist, New York City.

Arthur E. Hirst, superintendent, American Printing Company, Fall River, Mass.

*Clayton Hoagland, managing editor, American Dyestuff Reporter, representing A. P. Howes.

George H. Johnson, director of research, Laundryowners' Mutual Association, Philadelphia.

Daniel P. Knowland, chemist, Geigy Company, Inc., New York City.

F. R. McGowan, chemist, The Cotton Textile Institute, New York City.

Wm. R. Moorhouse, sales manager, National Aniline & Chemical Company, New York City.

Prof. Louis A. Olney, Professor of Chemistry and Dyeing, Lowell Textile Institute, and Chairman of Research Committee, A. A. T. C. C.

Dr. Walter M. Scott, service director, Munsell Color Company, Baltimore, Md.

Walter S. Williams, chemical engineer and purchasing agent, Mount Hope Finishing Company, North Dighton, Mass.

* Indicates non-members.

Chairman Wood called on Dr. Killheffer to outline the purpose of the meeting.

Dr. Killheffer in part explained the idea he had been fathering for some time, calling attention to the need of some well-organized effort of applied and fundamental research in the textile industry in general. He felt that while the A. A. T. C. C. had made great strides in the right direction, the proposition should be broadened and others beside the A. A. T. C. C. members be interested. It was with this idea in mind that the general committee had been called together, representing a larger field in the textile industry and trade press, so that the matter could be discussed pro and con, and some definite action taken. Dr. Killheffer felt that as a start a fund of $1,000,000 could be raised among the textile mills, and it seemed on the surface that at least 1,000 concerns out of about 7,000 in the trade could be interested to the extent of $1,000 each. He suggested that in conjunction with the research problems to be worked out, a high-grade testing laboratory might be carried on at the same time as a revenue producer to help along the main issue.

Professor Olney next explained in detail the work and accomplishments of the A. A. T. C. C. Research Committee for the benefit of new members who were not familiar with the work.

The meeting was then thrown open for general discussion, and Mr. Clark of the Textile Research Council spoke at length on the matter in hand, giving the committee a number of valuable ideas. He was rather inclined to believe that while the plan was a commendable one, it was too broad a scheme, thinking that possibly better results could be obtained if the A. A. T. C. C. kept to its present plans.

In answer to some of his remarks, Dr. Killheffer expressed the belief that it was quite proper to have such an ambitious program, as thereby we would command the respect and contributions of the industry at large.

Mr. Crawford of the Daily News Record spoke very encouraging words for the proposition, and concluded by suggesting that the idea assume concrete form and that a finance committee start at once to draw up a list of prospective contributors and get busy.

Mr. Johnson of the Laundryowners' Association indorsed the idea enthusiastically, and knowing what had been accomplished by his relatively small association as compared with the whole textile industry, felt that the fund suggested could be raised easily.

Mr. Baylies, of the National Association of Cotton Manufacturing, spoke encouragingly in regard to the scheme and suggested that the research not be limited entirely to chemistry, but to deal also with the physical.

Mr. Appel discussed different kinds of research, explaining the difference between applied and fundamental research and suggested different ways a research laboratory could be run and maintained.

H. A. Barnes, of the Proximity Print Works, made a few remarks, generally indorsing the plan.

Hugh Christison, of the Arlington Mills, made remarks somewhat opposed to previous comments. Some previous remarks had been made, citing the General Electric Company as an example of a large industry built up on research, and suggesting that the textile industry might possibly be improved in similar manner. Mr. Christison rather doubted the possibility of getting a sufficient fund collected from the industry because of such disunited conditions which exist and so many opposed and competing factions, and because of such factions, results could not be expected similar to the General Electric Company.

Mr. Johnson, in order to bring the matter to a head, moved that "a smaller committee be appointed by the chairman to draw up a definite program to be presented to the full committee at some later date."

This was duly seconded and voted.

The meeting adjourned at 4.00 p. m.

ALEX MORRISON, *Temporary Secretary.*

ROBERT K. LYONS

Robert K. Lyons, manager of the Apponaug Company and a prominent textile chemical engineer, and member of many technical and social organizations, died March 16, in his fifty-fourth year, at the Jane Brown Hospital, Providence, R. I., following an operation.

Mr. Lyons was born at West Hampton Beach, Long Island, and attended the Wilbraham, East Greenwich and Phillips Andover academies before he matriculated at Brown University, from which he received his degree with the class of 1899.

He served as an apprentice with the United States Finishing Company and later became chief chemist of the concern. For a time he was manager at the Pawtucket branch of the company. In 1924 he went to the Apponaug Company as manager. He lived with his family at 159 Lloyd Avenue, Providence.

Mr. Lyons was a member of the To Kalon Club of Pawtucket, the Wannamoisett Country Club, the British Empire Club, the Theta Delta Chi fraternity at Brown, the Associated Alumni of Brown University, the Players, the Colorists Club, the American Chemical Society, and the American Association of Textile Chemists and Colorists. He was third vice-president of the Providence Engineering Society.

He is survived by his mother, Clara Howell Lyons; a widow, Minnie Bartlett Lyons, and his daughter, Priscella Bartlett Lyons.

Robert K. Lyons represented one of the highest types of men that one encounters in American business life of to-day. Every one with whom he came in contact looked upon him as a real friend, and felt the warm, kindly interest that animated from his personality to a rare degree. There are not a few men in more or less prominent positions in the textile industry who owe their success in a large degree to his guiding hand. Never was he too busy to listen to the troubles of those he came in contact with, whether it happened to be a sweeper in one of the departments or the man at the top of the ladder, and invariably he left them with a much lighter load upon their shoulders.

One of his outstanding traits that showed the depth of his character was his interest in the young men in college and the young men in the various organizations with which he was connected. We all know how easy it is to dream of the fine things we hope to do for the rising generation. Robert Lyons was one who put the ideals most of us dream about into actual practice as part of his daily routine. We all know by heart the old adage, "He profits most who serves best." The harvest of Robert Lyons in terms of friendships, in the finest meaning of that term, is without measure.

As a textile chemist he was one of the outstanding men in the industry. His knowledge of the chemical problems arising in the bleaching, dyeing, printing and finishing plants of to-day handling the very best grades of cotton, rayon and silk fabrics was most complete from a scientific, technical or practical angle. It was almost impossible to present him with a problem for which he was not able to map out a method of attack which would have a reasonable expectation of solution. His thirty years as chemist and manager in three of the leading plants in this country clearly showed the influence he exerted in raising them to the highest levels of quality of output and to real financial successes.

Robert Lyons was one of the most striking examples of the truth that a man can make his mark in his chosen profession, in securing one of the higher positions that it has to offer, and still retain the most admirable characteristics of what one might call the ideal American scholar and gentleman. One of the finest tributes that could be applied to anyone has been applied to Robert Lyons, and expresses probably the true feeling of his many friends better than any other—"He was a prince of men."

Applicants for Membership

Active Membership

Boler, William J., textile colorist, Acme Finishing Company, 185 Front Street, Pawtucket, R. I. Sponsors: Charles B. Kendall and Ralph F. Culver.

Clement, D. S., chemist, Nashua Manufacturing Company, Nashua, N. H. Sponsors: Louis A. Olney and Stephen W. Bastow.

Fox, Lester R., salesman, Commonwealth Color & Chemical Company, 644 Diversey Parkway, Chicago, Ill. Sponsors: Arch J. Mease and A. T. Brainerd.

Grotelueschen, Nestor, dyeing superintendent, Holeproof Hosiery Company, Milwaukee, Wis. Sponsors: A. T. Brainerd and Edward Weber.

Hiller, Lee Roy, dyer, American Textile Dye Works, 1710 Third Street, Milwaukee, Wis. Sponsors: A. J. Feit and A. T. Brainerd.

Howells, Lloyd T., chief chemist, Cowles Detergent Company, 7016 Euclid Avenue, Cleveland, Ohio. Sponsors: F. H. Guernsey and Alex Morrison.

Stahl, William F., manager, Fibre Dyeing Company, 914 West North Avenue, Chicago, Ill. Sponsors: A. T. Brainerd and J. E. Stott, Jr.

Stamm, Carl, dyer and chemist, Cramerton Mills, Cramerton, N. C. Sponsors: Dyer S. Moss and Thomas Nuckolls.

Junior Membership

Hazlewood, Gordon C., foreman of dyehouse, Franklin Rayon Corporation, 86 Crary Street, Providence, R. I. Sponsors: A. Newton Graves and William F. Blair.

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

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WHY ADVERTISE THE NEED FOR RESEARCH?

IT WAS Mark Twain, we believe, who said, "Everybody talks about the weather, but nobody ever does anything about it." If Mark had been a textile manufacturer we might believe that when he made this classic wisecrack he was really thinking of fundamental textile research—about which so many have talked, but about which so very little has been done.

In fact, some misinformed textile men may assert that nothing at all has been done. This, of course, is not wholly true; readers of the REPORTER know that much valuable research work on textiles has been done and some excellent plans that provoke thought have been drafted. But until recently not many others in the industry have known precisely what those plans are, or exactly what kind of work has been done or who has been doing it. Or—what is far more important—*what remains to be done.*

We cannot blame the textile manufacturers, however, for not knowing these things. So absorbed are they, usually, in the immediate bread-and-butter business of making textiles that they can give little attention to the purely technical progress of their industry. They are, after all, not scientists but business men. This fact should be kept in mind by all the chemists and the physicists, the research engineers and the research groups in our industry. For it is the plain duty of the technical men to inform the business men of the industry from time to time upon the advances being made in technology, and upon the need for studies more fundamental than the studies which have been made.

If the groups of technical men should neglect to throw a spotlight upon their research work now and then, in order that Mr. Mill Owner may see what they are doing for his business; if they keep their needs and their plans modestly to themselves and mind their own business, serious trouble will result. For there will certainly come a day—and it usually dawns early in the efforts of every technical group working quietly in an industry—when they will sorely need the cooperation and financial support of those who own the industry. In the course of their work the technical men in an industry will have conceived research plans of ambitious scope which, if carried out, would advance their industry to a leading place in the world's markets. To launch these plans, however, much more than their trained brains will be needed. They must have a place in which their trained brains can properly pursue research; they must have equipment and unlimited time. In other words, the technical men in any industry eventually awaken to the great need of ample resources on which to draw in developing their ideals into workable plans of action that will benefit their industry. The finest research plan ever put on paper is worthless if it cannot be carried out.

If the technical groups, therefore, neglect to lay their schemes before the men who own the business, can they, in all fairness, expect those men suddenly to wax enthusiastic and to offer their hearty support to the project? They cannot; because, as we said before, the manufacturers are usually too busy with business to know much about what has been going on in their industry's laboratories. If their support is needed by the technical men, then those technical men must approach the busy executives in a body and *sell* them on the research plans.

Now, all this will sound like kindergarten patter to any seasoned, experienced research man. He has been through the mill, as it were, and knows all about the ignorance and stupidity, the resistance, the indifference and the criticism that too often block the research plans of enthusiastic technical groups. But there are not many seasoned research experts in our textile industry. And, if we may repeat ourself, the day *has* dawned in this industry when a great need for scientific research in textile technology has arisen. Various plans to fill that need have been formulated by trained technical men organized into groups; technical men who have not merely drafted plans on paper, but who have actually stained their hands in several years of patient laboratory study and work; study that has not been all theory, but has dealt with practical problems of textile chemistry; and work that has *laid the foundation* for some good plan of fundamental technical research. And with all this has come the need for the *best* plan and the need for financial support from the textile manufacturers.

* * *

The situation in which the various groups of technical men in our textile industry find themselves to-day was obviously clear to the Research Bureau Committee of the A. A. T. C. C. when this committee

called a special meeting a few weeks ago, to which it invited a number of representative textile men: heads of associations, mill managers, trade press editors. They gathered in New York to hear a word about what the A. A. T. C. C. has accomplished in its research studies on dyes and dyeing, and, for the greater purpose, to discuss the need for organized fundamental research on textiles and to suggest some plan whereby this research may be undertaken on a large scale.

Behind this meeting was a conviction that the time has come to call upon the leaders in the textile industry for their interest and support in setting up fundamental research. For too many years fundamental research has been, like the weather, merely talked about. Furthermore, the idea of going outside the A. A. T. C. C. to gain the interest of the important men in the industry is a sound idea; because, after all, the Association does not include everybody who understands this problem of how to establish scientific research in the textile industry. Clearly, the Association believes that adequate research can be established only if all elements in the industry will co-operate to support some well-defined plan of action. Therefore, the roll-call of the meeting included the editors of several leading textile publications, through whom the devotees of fundamental research can broadcast their gospel to those who control the resources of the industry. For it is very important to inform every man at the head of the industry about the need for that type of research and the need for money to carry out any plan adopted. The meeting held by the Research Committee was, in that respect alone, more than justified.

The meeting brought out a number of significant ideas. The problems of organized research were frankly discussed. Many doubts and fallacies were dispelled. Vague ideas about research were clarified for many of those who attended, and erroneous notions were turned into a more intelligent conception of fundamental research. The attitudes of opposing groups were sharply revealed, and a few very helpful suggestions were thrown into the discussion.

The laboratory work of various sub-committees of the A. A. T. C. C. was briefly explained to the gathering, and the ideals of the Association regarding research were cogently expressed by its officers. The original plan for establishing a Technical Bureau was outlined, and several other plans for pursuing industrial research, such as that on which the Mellon Institute operates and those plans by which the Laundry-owners' National Association and the National Association of Dyers and Cleaners have been able to undertake laboratory study on a broad scale, were discussed in turn.

One of the chief problems aired at this meeting was, of course, the problem of *financing* research. If one thousand textile manufacturers were each to contribute $1,000, Dr. Killheffer declared, a fund would at once be created sufficient to launch an adequate plan of organized industrial research on textiles. Most of those present agreed that this proposal was almost too modest for an industry as large and as important as the American textile industry. It was pointed out that in Europe, notably in Germany and in England, manufacturers evidently were not so severely as practical as our American mill owners, but more far-sighted, since the foreign manufacturers have provided liberally for textile research that promises no immediate returns.

But the meeting entered its most productive stage when the various plans submitted were freely criticized. One man contended, for example, that it would be wisest for the Association to limit its studies to its specialized field and to be wary of attempting to promote a plan too broad. Another asserted that any testing bureau set up by an association of textile men in connection with its fundamental research could not possibly be impartial, so far as the retailer's and the public's interests were concerned. Still another boldly questioned the need for technical research, purposely posing as a radical in order to bring home some of the criticisms which any research group may expect and which it must be prepared to answer.

Finally the question was advanced, Are there really enough technical problems in textile manufacturing to justify the establishment of a research bureau? This might be called the acid test of any research plan, and we are happy to report that in this case the Association's project came through unscorched. In the space of ten minutes a greater number of concrete technical problems calling for fundamental study were offered than any bureau could hope to solve without years of hard work, and it was plain that a whole flood of such problems would soon flow in upon those who called for them.

This meeting was among the first moves made by technical men in the textile industry to inform those who control the industry as to the real problems behind the need for scientific research. If it is followed by similar publicity, we may rest assured that fundamental textile research will no longer be like the weather, for at last somebody *is* ready to do something about it.

The Lowell Textile Institute's annual play will be held Friday evening, April 5, at the Lowell Memorial Auditorium. This year the Lowell Textile Players will present "Pals First," a three-act mystery-comedy. Dancing until 2 o'clock will follow the play, with music by Morley Pearl and his Tent Orchestra.

Reuben Messer, of Richmond Hill, Queens, Long Island, N. Y., has just been elected secretary of the Antipyros Company, of New York City. Mr. Messer is about to graduate from New York University with a degree of B.C.S. He will be in active charge of the credit and business offices of the company.

EXTRACTORIALS

The research worker must lead what might be called a semi-detached life. He must be perfectly free on the one side to develop as h pleases, while on the other he must be in the closest possible relationship with the industry which he is to serve.—*Colonel the Hon. F. Vernon Willey, in Textile World.*

Success or failure in a chemical enterprise to-day is most directly under the control of two factors, the soundness of the research and the adequacy of the capital that are behind the business.—*Chemical Markets.*

The development of an industry on a scientific basis can only be accomplished after long, arduous and tedious work of investigation of the seemingly insignificant and commonplace throughout the entire industry.—*Col. F. Vernon Willey.*

Cellulose constitutes practically the earliest chemical factory in the world. Before man existed on earth, before animals existed, back in the plant period . . . there grew great forests. A total of practically $3,250,000,000 is tied up in three industries making use of cellulose as such: the lumber industry . . . the cotton textile industry . . . the paper industry.—*Dr. Chas. H. Herty.*

SOKOLINSKI IN CHARGE OF TEXTILE DEPARMENT AT ARABOL

John J. Sokolinski has been appointed sales manager of the Textile Department of the Arabol Manufacturing Company, of New York, manufacturers of sizings, gums, oils and adhesives. He is located at the New York office of the firm, 110 East Forty-second Street.

Mr. Sokolinski has been for eight years plant chemist in the Arabol company's main plant in Brooklyn, and consequently he brings to sales problems an invaluable background of thorough technical knowledge and practical plant experience. In assuming his new duties it is understood that he is in no way severing connection with the manufacturing division, but will, on the contrary, continue to assist Arabol clients in their technical problems.

Before coming with the Arabol company Mr. Sokolinski was for a number of years with the bleaching station of the Roessler & Hasslacher Chemical Company at Perth Amboy, N. J., and later was engaged as chemist in the main plant of the Clark Thread Company at Newark, N. J., where he served for three years.

He has been an active member of the New York Section of the American Association of Textile Chemists and Colorists since its formation, and has been serving as treasurer of the section for the past four years.

CORRESPONDENCE

MORE ANENT "CELANESE" AND "RAYON"

March 4, 1929.

Professor Louis A. Olney,
Lowell Textile School, Lowell, Mass.

Dear Sir: We have your letter of February 21 in reply to ours of January 17 and note that the editorial to which we referred was written by Clayton Hoagland, your managing editor.

We understand from the last paragraph of your letter that you intend to publish our communication to you and your reply. We suggest that before any further reference is made in the AMERICAN DYESTUFF REPORTER to the use of rayon as a generic name you may be interested to secure expressions on the subject from representative dyers. We believe that the attitude in the dyeing industry with reference to the necessity for distinguishing Celanese and rayon is well represented in a recently published book entitled "The Cleaning and Dyeing of Celanese and Rayon," by L. E. Foster, 421 Lincoln Avenue, York, Nebr. This book also covers the subject of the necessity for a distinction between Celanese and rayon from the point of view of cleaning. The reasons which are given for distinguishing these different types of products will undoubtedly be interesting to you and to the managing editor of the AMERICAN DYESTUFF REPORTER. The book was apparently written as an aid to dyers and cleaners, and your readers would probably be interested in a review.

The third paragraph of your letter gives what appears to be a definition of what you understand as the meaning of the word "rayon," but we would call your attention to the fact that your definition would also include synthetic wool, chemically produced horse hair, or other fibers chemically produced from other than cellulosic materials, such as, for instance, gelatine, as well as future developments in the industry in imitation of other natural products, on which many experiments are being carried out with other basic materials, and all of which will undoubtedly have characteristics as different from rayon as Celanese has. You also state in this paragraph that the term "rayon" was "proposed and adopted more or less generally by the purchasing public, by manufacturers who use this type of fiber, and to a considerable extent by the manufacturers of fibers themselves." We do not know on what ground you make the statement that the purchasing public had anything to do with the proposing or adopting of the word, and we believe you are in error when you state that it has been more or less generally adopted by manufacturers who use this type of fiber. If by manufacturers you mean mills that knit or weave fabric, we believe you are in error to a considerable extent, and if by manufacturers you mean dyers and finish-

ers, we believe you are entirely wrong. As far as the manufacturers of fibers themselves are concerned, we are under the impression that only manufacturers of the Viscose type of synthetic yarn have made use of the term in describing their product.

We agree with you that the term "artificial silk" was in many ways erroneous and upon the whole unsatisfactory, and this company realized that fact prior to the time when there was any discussion of adopting some name to replace that misnomer and our company began using the name "Celanese" before any meeting was called to consider a substitute for the words "artificial silk."

We note that you believe the process of selection of a generic term will never be concluded if a number of manufacturers repudiate each attempt to find such a word. We suggest that the fundamental difficulty in this process of selection rests in the fact that an attempt is being made to find a so-called generic term for articles which belong to different classifications. We do not believe that a chemical compound, such as ours, can be properly termed "the same cellulose or at the most a chemical modification of it" as can rayon. Modified cellulose is accepted to mean such substances as hydrate or hydro-cellulose which constitute the body of rayons. The body of our fiber is not a "natural product, namely cellulose" but is a definite chemical compound—an ester. Since a number of manufacturers do repudiate the name others have adopted, why should an attempt be made to force such a name on them against their will? To our minds there is no more reason why all chemically produced fibers should be called by one name than that all natural products, such as silk, wool, cotton, etc., should all be known as cotton. There is a vast difference in the characteristics of the chemically produced fibers developed to date, and there may be even greater differences in those to be developed in the future.

We note that you object to the use of a descriptive term on the theory that it is not "adapted for trade and commercial purposes." We believe that this is an instance in which brevity in expression must be sacrificed for accuracy.

Regarding the next paragraph of your letter, we do not contend that "synthetic textile" is the only, or the most accurate, or the best descriptive term, to describe the whole field of chemically produced yarns, threads, filaments, and products. We would be entirely willing to consider any descriptive term that is equally inclusive. We might say here, however, that the phrase quoted and used by us in our letter to you has been used by the Federal Trade Commission in a recent release, copy of which we enclose herewith, and by the Silk Association of America in its brief recently filed with the Ways and Means Committee on Tariff Revision in describing what they mean by rayon, and in briefs filed with the Ways and Means Committee by J. S. Denham of the Du Pont Rayon Company, and in correspondence of the Department of Commerce. We would be interested to know if you could suggest a phrase that would be as short, as inclusive, and as easy for the layman to understand.

We entirely agree with your point of view that the less mystery there is the more likely the purchasing public will be to extend their uses for the product. Our whole effort is in the direction of the most accurate and definite form of description and merchandising. We do not think it makes less of a mystery to call a product by a name which does not suit it. Your suggestion that we call our product "Celanese rayon" is not a solution but rather opening the door to greater confusion and possible misrepresentation. It would not simplify matters to call the product "rayon" and then explain how it differed from rayon because this would necessitate a negative form of advertising and is setting up straw men just to overcome them again.

Your simile of Egyptian and Sea Island cotton is not in point because these as well as the ordinary grades are all cotton, and it makes no difference if the ultimate consumer does call them all cotton because that is what they are and they are all treated in the same way by dyers, cleaners, etc., and differ only in quality and not in chemical composition. Likewise, we do not consider your simile of synthetic indigo in point because we do produce a definite chemical compound from two or more materials just as crude as the so-called coal tar crudes you mention.

Your whole comparison fails for the reason that it assumes the very point in question. If Celanese products were rayon, there would, of course, be no objection to your suggestion, but, since the whole question is due to the difference between Celanese and rayon, your suggestion amounts to an attempt to solve the difficulty by forgetting it.

Since you are publishing your letter of February 21, as well as our letter to you of January 17, we would greatly appreciate it if you would also publish this letter.

Very truly yours,

CELANESE CORPORATION OF AMERICA.

* * *

The statement released by the Federal Trade Commission, referred to in the foregoing was as follows:

> The Federal Trade Commission has been requested recently to give a further expression of the intent and effect of the resolution adopted by the Commission on October 31, 1925, which states that:
>
> "The Federal Trade Commission hereby recognizes the term 'rayon' as meaning and properly designating the artificial silk products, the basis and chief ingredient of which is cellulose."
>
> In order to clarify a misunderstanding which is indicated by the inquiry to exist in the synthetic textile trade, the Federal Trade Commission announces that the intent and effect of the resolution is to make such use of the term "rayon" permissive but not mandatory.

March 6, 1929.

Celanese Corporation of America,

180 Madison Avenue, New York City.

Gentlemen: Your letter of March 4 continuing the discussion in regard to the term "rayon" has been received. We shall be pleased to publish this as you suggest. Upon careful study of this letter we find no reason for materially modifying our views as expressed in our communication of February 20, published in the AMERICAN DYESTUFF REPORTER of March 4.

We agree with you that the public had little if anything to do with the selection of the term "rayon"; although as we remember it, a prize was publicly offered to the person who should propose a satisfactory name. Whether this was the name proposed or not we do not know. We do know, however, that the purchasing public has more or less generally adopted the term, although we presume a large proportion of the people using the term have no conception as to its significance. We must remember, however, that people are more quickly instructed to-day than ever before, and we dare say that next June it would be difficult to find many graduates of a high school or perhaps even of a grammar school who did not in a general way know the principle involved in the production of what we have designated as the "rayons."

Apparently we are not alone in the opinion that the term rayon is in general use in the United States, and we quote the following paragraph from the February 8, 1929, issue of the Journal of the British Society of Chemical Industry:

"It is of interest to note that the largest manufacturer of artificial silk in Great Britain, Courtaulds, Ltd., has decided to abandon the use of the name 'artificial silk,' and to use the term 'rayon' only. 'Rayon' is in general use in the United States, and there can be no reason to complain of the replacement of the term 'artificial silk,' as 'rayon' has sufficient characteristics of its own to merit a name which is distinctive and descriptive of a textile fiber which ranks next in importance after cotton and wool."

Quoting directly from your letter:

"We note that you object to the use of a descriptive term on the theory that it is not adapted for trade and commercial purposes."

We did not intend to convey that idea at all. We objected only to the length of such a term. We still believe that a term accurately describing the source and type of such a fiber as we are discussing would be better if it were sufficiently short. The difficulty in accomplishing this has resulted in the adoption of the more or less arbitrary term "rayon," and, once adopted, what difference does it really make? How many can tell the actual derivation of, or even the connection of the terms cotton, wool and silk, except through association?

We cannot see that an adjective used for modifying or descriptive purposes in connection with the term rayon is objectionable. We have to-day, for instance, Chromium steel, Vanadium steel, etc., which are well recognized types and appear to be satisfactory to all concerned. There would appear to be no necessity for calling them something besides steel, and if the term "rayon" can be agreed upon as a satisfactory term for the type of fibers produced by a particular method, we can see no reason why the use of defining adjectives, as for instance in the case of "acetate rayon" should not be all that is necessary.

As to your reference to the comparison between different kinds of cotton and different kinds of rayon: As you state, the correctness of this all depends upon one's conception of the term rayon. As to the simile of synthetic Indigo, this of course is a matter of opinion. In the earlier days no one ever stretched his imagination enough even to think of designating the sulphonated product made from vegetable Indigo as a synthetic product, and we still believe that in the minds of most people a product made in a comparatively simple way from a highly developed vegetable substance like cotton, or wood fiber, could not be designated in the common chemical usage of the term as being synthetic. We surely do not refer to our automobile tires as being of synthetic rubber, although the raw material has been chemically modified as much if not more during the vulcanizing process, than is cellulose during the manufacture of some of the rayons.

There are at the present time, we believe, at least three manufacturers of cellulose acetate fibers. As time goes on the number of fibers which are comparable with Celanese is likely to increase rather than otherwise. This being the case, it is reasonable to assume that the term Celanese will lose some of the significance it had when it was practically the only fiber of this type on the market. This will be particularly true if each new manufacturer adopts a special trade or brand name for such a fiber. For this reason it appears to us that eventually and even now this particular group of fibers might well be designated as *acetate rayons*.

The writer of this letter is fully acquainted with the fundamental differences, both chemical and physical between all of the different fibers of the type under consideration, having worked with them for many years. He is not interested as a manufacturer or a distributor of any of these fibers, nor does he have any special attachment for the term "rayon." As a scientist, however, he is endeavoring to see all sides from as many different angles as possible, and by so doing finally arrive at a classification for purposes of instruction which, considering everything, will in the end prove most satisfactory for all concerned.

Sincerely yours,

LOUIS A. OLNEY.

Clyde Murray is now overseer of dyeing at the Virginia Cotton Mills, Swepsonville, N. C.

FIBER DETECTION SIMPLIFIED BY NEW INSTRUMENT

Physicist's Invention Said to Identify All Textile Materials

With the introduction on the market of an instrument no larger than a man's fist, part of the work of the analytical chemist has been eliminated. "Texilscope," which is the name of this little instrument, was invented by a physicist, H. T. Scott-Huntington, for the express purpose of identifying the various commercial fibers, whether of animal or vegetable origin.

The inventor tells of a significant occurrence not long ago in the office of the assistant chemist of a large woolen firm. This chemist had purchased one of the Texilscopes and had started to make tests with it. He subjected various pieces of what he thought to be pure wool to his wool test and found that the instrument was registering the presence of some vegetable fiber. Dissatisfied, he called upon Mr. Scott-Huntington.

At the office of the assistant chemist the tests which seemed unsatisfactory were repeated before the inventor. In less than a minute, the inventor states, he had "shot" the trouble—it appeared that the chemist had given his cloth only the piece test as differentiated from the yarn test, and that the presence of something like 5% impure wool had been denoted by the Texilscope. The chemist still was incredulous.

"These pieces of wool I have tested are known as commercial pure wool," he countered.

"That may be so," said the inventor, "but the presence of the merest vegetable fiber is detected by the Texilscope, and if the instrument registers the fact there are no two ways about it."

Mr. Scott-Huntington then proceeded to make tests with the warp and the fill-ins of the pieces. The warp tests showed the thread to be pure wool; the fill-in test showed the thread to be a vegetable fiber.

"So you see," Mr. Scott-Huntington explained, "that while I have no doubt your woolen materials are 100% pure wool in the commercial sense, they are only 95% pure wool in the strictly scientific sense."

The chemist, who had not thoroughly read the directions for making accurate tests, could but admit his mistake.

"I am very much concerned about this incident, however," continued Mr. Scott-Huntington, "for the fact that I demonstrated the accuracy of the instrument to your satisfaction is unimportant compared to the fact that its reputation was at stake so far as you were concerned."

It is important to note here that this instrument gives a qualitative test, and not a quantitative test, although, once the operator has observed closely the reactions of the instrument after numerous tests, an approximate calculation of the animal, metal or vegetable fiber content can be ascertained.

A good example of the way the Texilscope can be used for quantitative as well as qualitative tests, the inventor stated, is seen in the case of weighted silks. It is claimed that by close observation the operator will be able to tell within 2 or 3% the tin percentage in a piece of silk.

Any firm or individual dealing in silks, the inventor pointed out, should find the Texilscope useful for its ability to detect the presence of rayons in apparently all-silk fabrics. Of all the rayons, the cellulose-acetates, such as Celanese, are the hardest to detect when mixed in small quantities with pure silk. They infrequently deceive experienced buyers of silk. By one of the tests, known as the oscillatory test, the inventor explained, Celanese can be pointed out, because it is repelled by the "detector" of the instrument. Pure silk, by this test, would either remain unmoved or be gently attracted to the detector.

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i. e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

EXPERIENCED DYER

Boss dyer, experienced on rayon skeins, direct, naphthol and vat colors. Available immediately. Reliable. Address: Classified Box 520, American Dyestuff Reporter.

SITUATION WANTED

Textile chemist and colorist wants position. Thirteen years' experience in dyehouse handling silk and rayon yarn and pieces, also vat dyeing. Experienced in analyses, chemical control, experimental and development work. Address: Classified Box 519, American Dyestuff Reporter.

PACIFIC DYESTUFF SALESMAN

Position wanted by dyestuff salesman; several years' experience visiting all classes Pacific Coast trade. Capable, well acquainted; knows colors and requirements of consumers. Address: Classified Box 517, American Dyestuff Reporter.

WANTED

A chemist to demonstrate the uses of ammonium persulphate. Apply, giving details of training, experience and salary required. Address: Classified Box 518, American Dyestuff Reporter.

OPPORTUNITIES WANTED

Everybody is looking for opportunities. If you have a sound business proposition or a choice position to offer to a capable man, advertise the fact in this classified column. It is your best opportunity to reach *the man you want.*